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ABSTRACT

This document contains the proceedings from an international workshop entitled "Environmental Education in Asia and Beyond" held October 11-15, 1990 in the Republic of Korea. Papers include: (1) "Towards Education for a Sustainable Future in Asia and the Pacific" (Heck, Debbie); (2) "Communication Strategies for Sustainability" (Day, Brian A.); (3) "Learning and Teaching about the Environment" (Monroe, Martha); (4) "Developing Environmental Education Programs for Sustainability" (Monroe, Martha); (5) "Writing Proposals and Seeking Funding" (Monroe, Martha); (6) "Tips on Evaluation of Environmental Education Programs (1)" (Monroe, Martha); (7) "Tips on Evaluation of Environmental Education Programs (2)" (Monroe, Martha); (8) The Relationship between Environmental Education and Media in China" (Ding, Hongmei); (9) "Environmental Education for Sustainable Development" (Gurung, Hum); (10) "Environmental Education as a Vehicle to Promote Environmental Literacy in Low Literate Societies of the World" (Daudi, Sabiha); (11) "Environmental Education in China" (Wen, Bo); (12) "Capacity Building for Biodiversity Conservation in Vietnam" (Tung, Do Quang); (13) "Environmental Education in the Philippines" (Lapitan, Portia); (14) "Environmental Education Route in Conservation Area" (Hendarti, Latipah); (15) "Coast and Marine Schools Project" (Rodrigue, Mark); (16) "Environmental Education for Visitors in Korea National Parks" (Park, Kyeong); (17) "Ecological Education and Public Awareness" (Janjaadorj, Junduyn); (18) "Development and Implementation of an Environmental Education Program by Sabah Forestry Development" (Joeman, Bernadette); (19) "Case Study of Environmental Education Program of Forest for Life" (Lee, Kang Oh); (20) "Planning and Conducting an Environmental Education Workshop for a Rural Malaysia Community" (Lim, Gary); and (21) "Development Objective (Long-Term Objective) of The Project Vie/98/018 'Environmental Education in the Schools of Vietnam' (1999-2004)". (CCM)

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Proceedings

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Proceedings,
An International Workshop, October 11-15 1999
Republic of Korea

Environmental Education in Asia and Beyond

Ho-Am Faculty House, SNU / Hyun-Dai SungWoo Resort
Dae-Kwan Ryung Recreational Forest / Mt. Sorak Nation Park

Organized
by
Seoul National University/ North East Forest Forum
Environmental Forum of the National Assembly

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by
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The papers in this book comprise the proceedings of the workshop mentioned on the cover and title pages. They reflect the authors' opinions and, in the interests of timely dissemination, are published as presented and without change.

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Preface

Environmental education is a field of growing importance in the developing countries as well as developed nations. The study of environmental education is a fairly new field of study to natural resources scientists and professionals. Meanwhile there are many opportunities for environmental educators to contribute to the sustainable development of a society. Therefore, more educators and resource managers need to be trained with environmental education methods and exchanges of experiences in educating the public using environmental education programs. This workshop was designed to help educators and resource managers to learn about the theory and practical methods in environmental education.

The workshop is composed of two parts; one dealing with theory of environmental education program development and the other covering cases in different countries in Asia and the Pacific region. The contribution of each participant to the successful workshop is greatly appreciated I am sure each participant will benefit from active participation in the workshop activities..

I have been working for the preparation of this workshop for the last year, as a national project director of an UNDP project on environmental education development on trees and forests, and have enjoyed working with many warm hearted and talented people associated with the project. Included are Mr. Somsey Norindr and Mr. Keung-Sik Park, Mr. Kook Hyun Moon, Dr. Martha Monroe, Mr. Jun Seok Choi, Dr. Seok Jin Choi, Professor Seong-Il Kim, Dr. Boo Sik Shin, Dr. Dong-Kyun Park and Dr. Kyeong Park. Without the cooperation from them, it would be impossible for me to put together all the pieces of workshop preparation works.

I would like to thank Ms. Young-Sook Lee who has been supporting me in preparing this workshop by her enthusiastic work. I also appreciate all the members of Nature Economics and Policy Laboratory, Seoul National University for their roles in making this workshop possible. The financial support from UNDP, Northeast Forest Forum, National Assembly Environmental Forum, Korean Government (Forestry Administration), Korea National Parks Authority and Yuhan-Kimberly Corp. is much appreciated.

Yeo-Chang Youn, Chair
The Organizing Committee

Organizations

Organized by

Seoul National University

North East Forest Forum

Environmental Forum of the National Assembly

Sponsored by

UNDP

Forestry Administration, Republic of Korea

Ministry of Environment, Republic of Korea

National Parks Authority, Republic of Korea

Yuhan Kimberly Co.

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Environmental Education in Asia and Beyond

Keynote Speech

International Workshop on Environmental Education
in Asia and Beyond
October 11-15, 1999

Towards Education for a Sustainable Future in Asia and the Pacific

John Fien and Debbie Heck

Griffith University, Brisbane Australia

This paper outlines trends towards education for a sustainable future in the Asia-Pacific region. Our region covers about 23% of the world's land area and extends from Mongolia in the north to Tonga in the south, and from Japan in the east to Pakistan in the west. It contains nearly forty countries, of which seven are in South Asia, ten in South-east Asia, five in North-east Asia and fifteen in the Pacific and Oceania region. The region is home to 58% of the world's population but over 40% of the region's population is concentrated into five countries: China, India, Indonesia, Pakistan, and Bangladesh. The economy and the livelihoods of most people in the region are predominantly rural but urbanisation has been so rapid in recent years that the region also contains fifteen of the twenty-five cities in the world with over 10 million people - thirteen of fifteen most polluted cities in the world (Asian Development Bank, 1998).

Asia and the Pacific is a region of great cultural, economic and environmental diversity. This is reflected in the description of the region in UNESCO's 50th anniversary commemoration publication on the region which described it in the following way:

> From the world's highest city, Lhasa ... to the world deepest Lake Baikal...; from the highest mountain to the deepest seas; from the driest deserts to the dampest forests; the Asia-Pacific region covers an outstanding array of geography and culture.
>
> The region is one of sharp contrasts. It has two of the world's most populous countries, China and India, and some of the world's smallest countries, Nauru in the Pacific and the Maldives in the Indian Ocean. It has one of the world's richest countries, Japan, and the world's poorest, Cambodia and Bangladesh.
>
> With over 700 languages in Papua New Guinea alone, the region's ethnic and linguistic diversity is greater than anywhere else in the world. Great cultures have left legacies such as the Great Wall of China - 2350 kilometres long - ... and the legendary temples of Borobodor in Indonesia. A wealth of religions criss-cross the region, ranging from Buddhism, Hinduism, Christianity, Islam and Sikhism, to other faiths such as Confucianism, Jainism and Taoism. (UNESCO-PROAP, 1996)

This diversity means that it is difficult to be anything but general in an account of the development of education for a sustainable future in the region. The paper begins with an overview of the present state of the natural and social environment in the Asia-Pacific region. This is followed by an account and examples of educational responses to the challenges of sustainable development. The main theme developed here is that countries and organisations in the region responded well to the first phase of challenges of sustainable development posed by Chapter 36 on Education Information and Training in Agenda 21. Examples of innovative ways in which this has been done is provided to illustrate this. However, the analysis of these trends, which is presented in the next section of the paper, indicates that these innovations may represent a case of 'innovation without change' as there is little evidence in the region of the broad reorientation of education practices, systems and structures that is necessary for education to support the processes of sustainable development on national or regional levels. This wider reorientation of education is called the second phase of education for a sustainable future in this paper. The paper concludes with a brief case study of one project in the region which is using teacher education as a starting point to provide the necessary capacity development needed to support this second phase of educational reform.

The State of the Region

Despite the formulation of many international and national policies for sustainable development in recent years, the global picture is not encouraging. The state of the planet and the lives of the people who call it home have been exhaustively documented by such bodies as the United Nations Development Programme (1998), the United Nations Environment Program (UNEP 1997), the World Bank (1998), the World Resources Institute (1998), the World Watch Institute (1990), and the World Wide Fund for Nature (1999).

Data on conditions in Asia and the Pacific are also becoming increasingly well-documented, as seen in reports of the United Nations Economic and Social Commission for Asia and the Pacific (1990), the World Bank (1993) and the Asian Development Bank (1997). These publications paint a generally bleak picture of a descending spiral of unsustainable development. For example, the Asian Development Bank's report, *Emerging Asia: Changes and Challenges* (1997), argues that:

> Asia is the world's most polluted and environmentally degraded region.... The range of environmental problems is huge - from the degradation of rural land to the pollution and congestion of the region's mega cities. Some areas have unique difficulties, such as the danger that rising sea levels pose for the Pacific Islands. Some environmental problems are created locally, such as the pollution of water resources, while others are involuntarily imported from abroad, for instance, acid rain in Japan and Korea comes largely from coal burning in the People's Republic of China. (p. 201)

The social and economic costs of environmental degradation in the region are very high. This descending spiral of environmental decline and lost social and economic opportunities is reflected in the broad patterns of living conditions in Asia and the Pacific. Despite being home to some of the world's largest and fastest growing economies in countries such as Japan, Australia, New Zealand, Singapore, Taiwan and the Republic of Korea, the Asia-Pacific region is also one of great poverty. The acute impact of the 1997 economic collapse in the region is evidence of the precarious nature of the last three decades of development efforts. Thus, the Asia-Pacific region is home to over two-thirds of the world's poor and an equal percentage lack basic literacy. Population figures have doubled over the past forty years and are still on the increase, and the environmental and social effects of such numbers are beginning to take their toll. Thus, UNESCO has noted that:

> By the year 2040, the population of the Asia-Pacific region is expected to have doubled to an astounding 3.3 billion people. The region is already home to 63 per cent of the world's population, with five countries alone accounting for 46 per cent of the world's population - China, India, Indonesia, Pakistan and Bangladesh. The world has never seen such growth in so short a time. By 2040 requirements for food will have doubled and the need for water and sanitation quadrupled. The consumption of energy and manufactured goods will increase fivefold, while pollution may increase up to tenfold. (UNECO-PROAP, 1996)

Educational Responses

Education has been identified as a critical way of addressing this range of concerns in the Asia-Pacific region. Thus, many countries in the region can point to ways in which their education systems have been responding to the challenges posed by the descending spiral of unsustainable development. Many of their initiatives preceded the Earth Summit and are the result of the active International Environmental Education Programme led by UNESCO and the United Nations Environment Programme (UNEP) in the region. After the 1977 Inter-governmental Conference on Environmental Education in Tbilisi, follow-up workshops were held in Asia in 1997 and 1980. These provided for a range of catalytic activities, including: the exchange of information among institutions, the collection and dissemination of information, publication of materials for use in curriculum development and teacher education, study-visits and attachment programmes, demonstration projects, and the development of a pool of experienced resource persons to provide consultancy services to the Member countries (Gregario, 1993). The impacts of this and related programmes may be seen in the relatively high adoption of forms of environmental education in schools across the region. These include: the development of curriculum guidelines and new teaching materials, the revision of syllabuses to infuse an environmental perspective, the adoption of whole-school approaches to curriculum planning for environmental education, and the establishment of specialised environmental education centres.

During the 1990s, efforts were made to integrate the concept of sustainable development into these initiatives. The basic thrust for this began with the Earth Summit and was further encouraged by the Third Ministerial Conference on Environment and Development in Asia and the Pacific that was held in 1995 under the auspices of United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). This meeting decided upon a five year Regional Action Programme for 'environmentally sound and sustainable development' in the region. Responsibility for catalysing educational reform under this plan lies with UNESCO and UNEP but several other bodies have also taken initiatives. It is too soon to see the result of these efforts but their intentions are to promote sustainable development through education and related capacity building initiatives. For example, the UNESCO Asia-Pacific Programme of Education for All (APPEAL) focuses on universalizing primary education and eradicating illiteracy in the region as a foundation for the social and economic development. UNICEF also plays a major role in this goal. The UNESCO Asia-Pacific Programme of Educational Innovation for Development is active in the areas of secondary education reform, education for girls, pavement dwellers and refugees, vocational education and higher education, including teacher education. These are important elements in the reorientation of mainstream education towards a sustainable future. UNEP supports the development of capacity to develop and teach courses on sustainable development issues in the region's universities through its Network for Environmental Training at Tertiary Level in Asia (NETTLAP).

The Association for South East Asian Nations (ASEAN) and the Asia Pacific Economic Cooperation (APEC) have small information, training, and network programmes to support member countries while the South Pacific Regional Environment Programme (SPREP) has prepared a draft *Action Strategy for Environmental Education and Training in the Pacific Region* 1999-2003 (SPREP, 1998). Several international NGOs are also active in supporting education strategies for sustainable development the region. For example, IUCN supports the South and South-east Asia Network for Environmental Education (SASEANEE) while WWF has initiated a *South Asia Regional Cooperation Programme Framework* as part of the WWF Global Priorities to capacity building for managing natural resources (CEE/IUCN, 1998). The Asia-Pacific Bureau of Adult Education (ASPBAE) has developed a framework environmental adult education in the region in order to promote the principles of the *Treaty on Environmental Education for Sustainable Societies and Global Responsibility* endorsed at the NGO Global Forum at the Earth Summit in 1992. Regional conferences of the Asia Environmental Council (AEC) and the Asia-Pacific NGO Environmental Conference (APNEC) have also emphasised the importance of education in creating sustainable societies. The Environment Agency of Japan and the newly formed Institute for Global Environmental Strategies (IGES) are also supporting cooperative regional efforts to promote sustainable development through education. For example, IGES has initiated a review of the policies and capacities of NGOs, the media and formal education systems in the region to promote sustainable development. As a result of initiatives such as these, many examples of innovative practice may be found across the region. The examples in Table 1 are presented in alphabetical order of country name and illustrate the range of innovations that may be found in the region and which may become

increasingly widespread as the innovations are diffused more widely.

Table 1. Examples of innovative practices in the Asia-Pacific region (Fien and Tilbury 1996)

Australia	• A tradition of school based curriculum development within broad framework syllabuses which encourages local innovation and across-the-curriculum support for environmental education. • A series of state policies, curriculum guidelines and support materials for environmental education. • Integration of professional development with curriculum development in Landcare Education programmes.
People's Republic of China	• Environmental protection is a basic state policy. • Chaozhou City was named by UNEP as one of the "500 Best cities in the World" for its achievements in environmental education where 200,000 students in over 1,000 schools underwent an environmental education programme which combined i-school and out-of-classroom activities. • Teacher education for sustainability project sponsored by WWF.
India	• The National Policy on Education of 1968 and 1986 made environmental themes integral aspects of the curriculum. • The National Council of Educational Research and Training (NCERT) has produced model national textbooks for Years 3 - 5 on environmental studies. Beyond Year 6, texts of all subjects are to include environmental education. • The Supreme Court of India has made a court order to ensure all education systems promote environmental education. • Environmental themes integral to adult and nonformal education.
Indonesia	• A network of Environmental Study Centres in universities and incorporation of environmental education into national policies on environmental management. • A system of non-degree training programmes in environmental impact assessment and other topics. • Widespread co-operation between schools, universities and community in local action projects such as Clean River Campaigns.
Japan	• Comprehensive attention to environmental topics in a wide range of primary and secondary school subjects. • Identification of issues concerning the promotion of environmental education. For example: - the need to relate environmental education to pupils' lives to improve quality of life, and - the development of teaching materials, especially on the local environment covering the full range of environmental education approaches. • Development of links between schools and administrative agencies, eg Ministry of Environment and Ministry of Education, to produce guidance notes and supplementary readers for primary and lower secondary schools, and to coordinate in-service education.
Malaysia	• "Man and Environment" topics integrated into five subjects in primary school: Social Science, Health Education, Civics, History and Geography. • A wide range of co-curricula activities, eg. nature clubs, Environment

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	Week, camping, "School in the Garden", and environmental education projects. • Government agencies, NGOs and media support environmental education.
New Zealand	• Involvement of the NGO sector in environmental education is strong, eg. New Zealand Natural Heritage Foundation and Environmental Education Centre of New Zealand. • School/University links provide special programmes for teachers and students through programmes such as Eco-school and Enviro-school.
Philippines	• Environmental concepts and skills integrated into National Minimum Learning Competencies for elementary schools and Desired Learning Competencies for secondary schools. • A national environmental education review gave strong support for formal and non formal environmental education. • A strong curriculum materials and professional development programme in environmental education for teachers.
Republic of Korea	• Environmental Conservation Model School programme to provide examples of environmental education across-the-curriculum. • Environmental education is central in the new Sixth Curriculum from 1995. At the secondary school level it will be a separate subject.
Singapore	• Environmental Education is central in the government's plan to become a Model Environmental City by 2000. • There are at least fifteen different governmental and non-governmental institutions that are actively involved in promoting environmental awareness and action nation-wide. • Successful "Clean River" campaign and the promotion of the annual "Clean and Green Week". • Environmental education is already incorporated in the academic and curriculum studies in the pre-service teacher education.
Sri Lanka	• A strong connection between culture and religion and the philosophy of environmental education. • National Education Commission requires schools to contribute to "the evolution of a sustainable pattern of living". • Strong integration of environmental topics into primary and secondary curriculum, and the setting up of "Environmental Pioneer Brigades" and Environmental Clubs in some schools. • Active NGO involvement in environmental education.
Thailand	• Environmental education is integral to the issues of quality of life and health. • Environmental education is integrated into three units in the Life Experiences curriculum in elementary schools. Life Experience integrates Science, Social Studies, Health and Moral Education. • Community development electives in junior secondary social studies provide wide opportunities for student participation in working to solve local environmental problems. • There is a goal to have an accredited environmental park and community resource centre in every village.
Viet Nam	• Environmental education is integral to the 1991 National Plan on Environment and Sustainable Development. • Incorporation of environmental education into three subjects in primary

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	school (Finding Nature and Society, Health Education and Moral Education) and three in secondary school (geography, biology and moral/civic education). • Incorporation of National Festival of Growing Plants directly into the curriculum with inter-Ministry cooperation.

An Analysis

This overview of region-wide efforts to promote sustainable development through education indicates that the emphasis thus far has been upon what might be described as the first phase of educational reform that followed the Earth Summit, ie the reformulation of environmental education to include issues of sustainable development. This was not a difficult task as the concept of 'environment' in the region has always included the human element. In many cultures, nature is seen as a 'mother' or as a teacher and, as life in most Asian societies remains predominantly rural and organised around the seasons, people can easily see that the quality of their lives is related to the sustainability of the natural world. With air and water pollution being the major causes of infant mortality in the region (in that the most dangerous things a child under five can do is breathe the air and drink the water), environmental education guidelines could readily integrate the rhetoric of sustainable development. However, the wider reorientation of educational practices, systems and structures to support sustainability that is emerging as the second phase of educational reform since the Earth Summit is yet to be seen in the region.

As a result, several outstanding issues and problems remain. In most countries in the region, for example, most initiatives have remained embedded within pre-Earth Summit conceptions of environmental education. These tend to favour nature conservation, especially through the study of science and geography, rather than the multi-disciplinary bases of sustainable development and the holistic imperatives that are served by the emerging concept of education for sustainable futures. Consequently, most initiatives to promote environmental education in the Asia-Pacific have tended to come from Ministries of Environment, Agriculture or Natural Resources rather than Ministries of Education. While welcome, the efforts of such ministries tend to be directed to specific environmental issues rather than a whole-of-government commitment to sustainability. They also tend to concentrate upon information and awareness-raising campaigns directed at individual behavioural change rather than broader educational or sustainability goals. Indeed, sustainable development is not well understood as a concept outside of limited environmental circles in most countries and, certainly, is only rarely being pursued as a whole-of-government commitment. Several countries in the region also still lack national policies or guidelines for environmental education. The result of this set of problems has been a lack of coherence and long term planning for educational approaches to sustainable development. Indeed, even in those countries that do have environmental education policies, very few have been revised to incorporate the broad social, economic and political, as well as conservation, aspects of sustainable development.

The general lack of interest in matters of sustainability by Ministries of Education has tended to marginalise environmental education from mainstream education policy. Most countries therefore lack a coherent plan for progression in environmental education from kindergarten to college level. As a result, it is often not a priority, especially where the curriculum is over-crowded. In addition, the low profile of environmental education and sustainable development in external examination subjects contributes to a lack of status for this area of learning. Therefore, it is not surprising to find that many teachers, students and parents do not perceive it as a curriculum priority. In some countries the innovative teaching methods of environmental education conflict with the traditional culture of schooling. This problem is particularly acute in countries where the curriculum emphasises the recall of content and external examination performance rather than the development of thinking and problem solving skills. Such problems are intensified by a general lack of awareness and support for environmental education from many education policy makers, school administrators and academics in teacher education institutions. This makes the introduction of both in-service and pre-service teacher education for sustainability difficult and, unfortunately, when in-service courses are provided, they tend to be attended by teachers who are already committed to environmental education. As a result, the official as well as the 'hidden curricula' of schools are often not sympathetic to the social vision of education for a sustainable future. Indeed, while the official curriculum is often deficient in these matters, the 'hidden curriculum' is often an even greater barrier to sustainable development.

The effects of this pattern may be seen in the results of an international project that investigated the environmental knowledge, attitude and actions of over 10 000 sixteen and seventeen year old students in eleven countries in the region. The research involved a study of the cultural background and educational system in each country, questionnaire surveys and focus group interviews in each country and a meta-analysis of the national studies (Yencken, Fien and Sykes, in press). Three key findings of the study indicate that much remains to be done to ensure that education, especially in secondary schools, is reoriented towards sustainability. These relate to: levels of student awareness and interest; the learning of appropriate concepts; and the willingness and ability of students to adopt sustainable lifestyles behaviours and to share civic responsibility for sustainable development activities.

Levels of student interest in the environment

Several findings from the research indicate that young people in the Asia-Pacific region have a strong interest in learning much more about environmental matters than they are currently. For example, Table 2 shows that students in only one country (Singapore) wanted less frequent regular discussion of environmental matters in class. Similarly, in the focus group interviews, students from several countries reported that they had "learnt hardly anything at all about the environment since primary school" and did not believe that it was fair for these sort of topics to be taught only to those students who study biology or geography.

Table 2 Current frequency of 'regular' discussion of environmental matters in class versus the percentage of students who say that they would prefer to do this regularly in selected Asia-Pacific cities and countries (Yencken, Fien and Sykes, in press)

	Current Frequency	Desired Frequency
Australia-Brisbane	30	50
Australia-Melbourne	29	55
Indonesia	44	88
Brunei	33	59
China - Guangzhou	11	38
China - Hong Kong	19	41
India	54	79
Japan	16	27
New Zealand	19	38
Singapore	18	3
Thailand	14	65

Learning of appropriate concepts

The students in the survey were asked to indicate whether they were familiar with a set of eleven concepts and then to define them. Tables 3 and 4 show the concepts that students are presently learning about in school are limited to traditional concepts from biology and geography, such as renewable resources, ecology, interdependence and carbon cycle, and the two major climate change issues of ozone layer depletion and the Greenhouse Effect. Students reported that they were partially familiar with the concept of sustainable development but that they were not familiar at all with the related concepts of biodiversity, carrying capacity, precautionary principle and intergenerational equity. When students were asked to define this set of concepts, their knowledge scores were very disappointing. This situation points to the urgent need to integrate such concepts into syllabuses in the region so that students can begin to develop an understanding of concepts central to sustainable development. While only five such concepts were used in the survey, many others from the fields of political ecology and ecological economics could have been used. These include: ecological footprint, ecospace, natural resource accounting, life-cycle analysis, environmental assessment, eco-efficiency, sustainable consumption and so on (OECD 1997).

Table 3 Group 1 Concepts: Relatively high level of awareness and knowledge (Yencken, Fien and Sykes, in press)

	Greenhous Effect	Ozone Layer	Renewable Resources	Ecolog y	Carbon Cycle	Interdependence
Australia-Brisbane						
- Heard of	99	99	94	88	53	60
- Discussed in class	81	81	59	44	20	18

- Correct	24	39	59	35	44	77
Australia-Melbourne	98	99	94	94	74	70
- Heard of	81	81	61	67	41	26
- Discussed in class	68	36	61	50	47	-
- Correct						
Bali						
- Heard of	-	-	-	-	-	-
- Discussed in class	74	76	92	88	81	-
- Correct	27	47	85	80	44	
Brunei						
- Heard of	98	99	98	90	91	71
- Discussed in class	58	57	58	51	73	20
- Correct	63	37	-	44	60	-
China - Guangzhou						
- Heard of	92	97	98	94	56	94
- Discussed in class	46	49	67	46	26	33
- Correct	7	54	70	44	40	-
China - Hong Kong						
- Heard of	98	96	98	72	47	78
- Discussed in class	59	47	56	35	18	25
- Correct	11	25	42	55	40	-
Fiji						
- Heard of	-	-	-	-	-	-
- Discussed in class	-	-	-	-	-	-
- Correct	29	45	43	42	36	-
India						
- Heard of	100	97	99	100	99	97
- Discussed in class	95	93	95	73	95	85
- Correct	67	57	51	73	50	-
Japan						
- Heard of	86	92	32	92	52	50
- Discussed in class	33	58	6	18	18	8
- Correct	48	82	10	14	26	-
Korea						
- Heard of	-	-	-	-	-	-
- Discussed in class	-	-	-	-	-	-
- Correct	61	70	29	19	23	-
New Zealand						
- Heard of	95	97	91	78	75	79
- Discussed in class	64	67	60	38	50	45
- Correct	55	32	49	24	48	-
Singapore						
- Heard of	99	99	99	97	91	84
- Discussed in class	91	88	77	71	73	45
- Correct	94	75	57	59	78	-
Thailand						
- Heard of	99	99	87	99	70	98
- Discussed in class	70	69	36	69	27	32
- Correct	15	39	61	82	16	-

Table 4. Group 2 Concepts: Relatively low level of awareness and knowledge (Yencken, Fien and Sykes, in press)

	Sustainable Development	Carrying Capacity	Biodiversity	Intergen'al Equity	Precautionary Principle
Australia-Brisbane					
- Heard of	51	43	49	52	21
- Discussed in class	12	10	12	4	3
- Correct	26	77	82	66	21
Australia-Melbourne	57	55	49	48	23
- Heard of	20	22	18	8	3
- Discussed in class	26	79	79	63	19
- Correct					
Bali					
- Heard of	-	-	-	-	-
- Discussed in class	31	28	93	35	26
- Correct	70	64	37	82	61
Brunei					
- Heard of	54	50	57	25	37
- Discussed in class	7	9	33	3	3
- Correct	9	40	69	50	25
China - Guangzhou					
- Heard of	87	72	90	62	66
- Discussed in class	11	22	43	11	15
- Correct	53	65	50	73	55
China - Hong Kong					
- Heard of	48	52	41	44	38
- Discussed in class	9	16	12	9	8
- Correct	24	66	52	59	25
Fiji					
- Heard of	-	-	-	-	-
- Discussed in class	-	-	-	-	-
- Correct	34	49	41	46	25
India					
- Heard of	68	48	86	35	26
- Discussed in class	38	26	72	17	14
- Correct	25	39	46	71	19
Japan					
- Heard of	43	43	67	36	26
- Discussed in class	13	10	12	4	3
- Correct	49	55	24	39	20
Korea					
- Heard of	-	-	-	-	-
- Discussed in class	-	-	-	-	-
- Correct	54	-	55	60	63
New Zealand					
- Heard of	47	54	50	40	31
- Discussed in class	12	13	15	8	6
- Correct	20	58	58	53	49
Singapore					

- Heard of	45	62	53	30	28
- Discussed in class	10	25	19	4	4
- Correct	19	22	86	66	32
Thailand					
- Heard of	34	95	90	94	96
- Discussed in class	6	55	39	25	25
- Correct	60	70	68	64	14

The willingness and ability of students to practice civic responsibility

The third and, perhaps, most disheartening finding of the research r was the ambivalence that the young people showed towards making life style changes and practising civic responsibility in accord with their high levels of expressed concern for, the environment. While the young people in every country expressed a strong desire to improve the environment, few reported a past record of active environmental citizenship or a willingness to work for environmental protection in the future. Recycling and reusing, choosing household products that are better for the environment, and reducing water consumption were cited as regular activities by some students and some also said that they had taken part in tree planting and clean-up campaigns. However, only a very small minority of young people in any of the countries said that they had written letters, signed petitions, attended meetings or made formal complaints. These 'political' actions are also the actions that most said that that they would not consider taking in the future. This is despite the fact that a large majority of respondents (between 70% and 94%) in all countries stated that they felt 'positive' or 'really good' when they took pro-environmental actions and that they generally experienced positive reactions and strong support from others involved, their teachers and their immediate families.

This paradox cannot be easily explained. There are many cultural and political barriers to Western styles of active citizenship in several counties in the Asia-Pacific region. However, there is a strong indication in the survey findings that the nature of common educational experiences also plays an influential role. For example, most young people said that they had poor skills and knowledge for bringing about environmental improvements, even if in only a small way. When they were asked to rate their knowledge and skills in this area, the highest response in all countries was only a medium ranking. Indeed, students in all the countries studied said that the two most common reasons for not acting in an environmentally-friendly way were beliefs that (i) their actions would not make a difference, and (ii) that there was no practical alternative even when they knew that what they did was wrong. This reflects not only a lack of knowledge of possible alternatives but also a failure of schools to provide students with experiences that teach such knowledge and skills. It also indicates that students have rarely had the opportunity to work with others on practical environmental projects and develop confidence in their individual and collective abilities to successfully bring about change.

A re-affirmation of the contribution of education to active citizenship would mean

that one of the central goals of education would be to help students learn how to identify elements of unsustainable development that concern them and to address them. This would involve students learning to reflect critically on their place in the world and considering what sustainability means to them and their communities. It would also involve practice in envisioning alternative ways of development and living, evaluating alternative visions, learning how to negotiate and justify choices between visions, making plans for achieving desired ones, and participating in community actions to bring such visions into effect. These are the abilities that Jensen and Schnack (1997) describe as "action competence". Democratic action competence is the opposite of predetermined behavioural change as a goal for education and aligns education for sustainability as part of the process of building an informed, concerned and active civil society. In this way, education for sustainability can contribute to education for democracy.

Reorienting Education towards a Sustainable Future: The Role of Teacher Education

This situation indicates the need for a revision of the objectives and content themes of school curricula in the region so that sustainability is a central concern, and teaching and learning processes emphasise appropriate concepts, learning how to learn, civic mindedness, and the motivation and abilities to work with others to help build a sustainable future. This is not a small task for, as Smyth (1995) has remarked, "It is difficult to avoid the conclusion that many have reached that education should be largely recast" when the wide scope of the task of reorienting education towards sustainability is considered (p. 18). This will require a realignment of the major foci of education. Schools have the role of both empowering students to play an informed and active role as members of society and encouraging the politically endorsed (and mostly economically motivated) values, practices and institutions of the existing social order. These are not mutually exclusive roles, and education is designed to promote both. However, without a whole-of-government commitment to sustainable development in most countries, schools have tended to reproduce an unsustainable culture that intensifies environment and development problems rather than one that empowers citizens to work towards their solution. This situation of unbalanced priorities calls for a reaffirmation of the role of education in building civil society by helping students: (i) develop criteria for determining what is best to conserve in their cultural, economic and natural heritage; (ii) discern values and strategies for creating sustainability in their local communities; and (iii) work with others to build sustainability outwards to include national and global contexts. This is not to say that the economic imperatives that underlie the reproductive functions of formal education are to be ignored. Economically sound, ecologically sustainable and socially just forms of development are to be encouraged; indeed, appropriate development is a core principle of a sustainable society. However, a reorientation of education towards sustainability calls attention to the problematical effects of inappropriate development and unfettered economic growth, and also to the ways that these are perpetuated through dominant patterns of schooling and the narrow and limited range of knowledge, attitudes and skills students tend to learn as a result.

The curriculum reforms that flow from a reorientation of education towards sustainability need to be supported by reforms to many current patterns of curriculum development and assessment in the Asia-Pacific region. For example, the centralised control of teaching and learning through nationally mandated syllabuses, textbooks and assessment in many countries does not readily support the localisation of curriculum themes or encourage student participation in local community projects. These reforms also require new attitudes and skills among teachers. This makes teacher education an especially important area for action.

Our Common Future, the Report of the World Commission on Environment and Development (1987) states that 'the world's teachers ... have a crucial role to play' in helping to bring about 'the extensive social changes' needed along the pathway towards a sustainable future (p. xiv). For teachers to play this role successfully they require a commitment to the principles of education for sustainability; without it, they may lack the skills, insights and desire to ensure that their students are provided with opportunities to learn how to contribute to the ways their communities are working to advance the transition to sustainability. Thus, teacher education for sustainability has been the theme of a major UNESCO project in the Asia-Pacific region.

The *Learning for a Sustainable Environment – Innovations in Teacher Education Project* began in 1994 to assist teacher educators in the region include the principles and innovative teaching and learning strategies of education for sustainability in their programmes. Regional and subregional meetings in 1993 and 1994, which had been convened by UNESCO and the South East Asia Ministers of Education Association, provided the necessary needs analysis and direction for the project. These indicated that the project should focus on the personal and professional development of teacher educators, rather than on the production of resources, in order to encourage appropriate pedagogical practice in teacher education which could have multiplier effects with teachers and their students (Fien, forthcoming)

Thus, the primary aim of the project was to support teacher educators in the Asia-Pacific region as they developed locally relevant ways of rethinking their courses and make plans to reorient teacher education in their colleges and countries towards sustainability. The project developed an action research network of teacher educators across twenty countries in the region. The purpose of the network was - and remains - to support teacher educators who wished to share in writing carefully-researched, evaluated and culturally-sensitive modules for use in initial pre-service and continuing in-service programmes in teacher education .

Evaluation reports indicate that the major outcome of the network has been the professional development of those involved and a series of national workshops and networks in many countries in the region (NIER 1996, Fien 1999). An attractive professional development guide has also been published (Fien, Heck and Ferreira, 1997). Containing edited selections from the most interesting and innovative work completed by the network, the modules in this guide are not seen as a finished product but as inspirations

for further adaptation in different countries. Some evidence of the success of this project includes:

- Publication of an Internet version of the guide at: <http://www.ens.gu.edu.au/ciree/LSE/index.html>;
- Adaptations of the modules and translation (*) of some or all modules in India, Pakistan, Indonesia*, Thailand*, Vietnam*, Singapore, Malaysia*, Philippines, New Zealand, Hong Kong SAR, Taiwan* and Fiji;
- Adaptation of the modules in India for use in a professional development programme for 70 teachers colleges in Karnataka state;
- Adaptation (and translation) of the modules to suit nursing education by staff of the national Department of Health in Thailand;
- Adaptation and use of modules in masters courses in Thailand, Australia, New Zealand and Japan;
- Adaptation and use of modules in a professional development guide and training programme on Coastal and Marine Studies in Australia; and
- Adaptation of some of the modules for a UNESCO multimedia teacher education programme for teachers called *Teaching and Learning for a Sustainable Future*.

CONCLUSION

Education for a sustainable future in its second phase form of a widespread reorientation of educational practices, systems and structures is not common in the Asia-Pacific region. This is a very large undertaking and one that the economically wealthy regions of the world have yet to make. Therefore it is not surprising that one of the world's economically poorer countries is yet to enact such reforms. However, there is sufficient leadership in the region, in the form of international and regional agencies and active NGOs, to indicate that if Member States can be convinced that a whole-of-government approach to sustainable development is desirable, then the teacher educators, curriculum development officials and teachers of the region will have the necessary support to make the necessary reforms.

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International Workshop on Environmental Education
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Environmental Communications Strategies for Sustainability

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As educators we like to believe that as we impart information, our students change their attitudes, and that in turn changes their behavior. Changing behavior is important because it is human behavior that affects the environment for better or for worse. Although environmental educators deal most directly with knowledge and attitudes, human knowledge alone doesn't harm or help the environment; human attitudes don't harm or help the environment. Human behaviors, of the other hand, have done a great deal of harm—and can a great deal of hope for helping the environment. If we are going to work for sustainability we need to address human behavior.

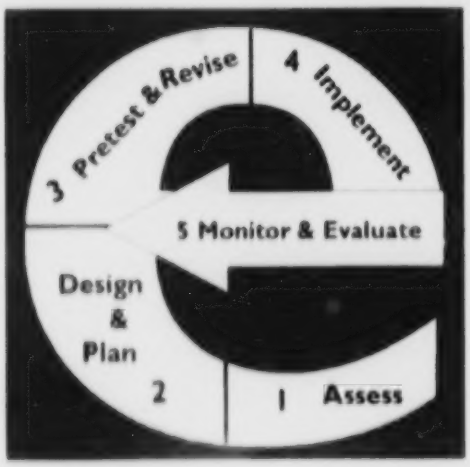
Behaviors, of course must be supported by knowledge and attitudes. But research in the field of environmental education and in commercial marketing have shown that there is no cause- and- effect progression from knowledge to attitude to behavior as educators have long believed. The relationship among these three things is often puzzling.

Research shows that people who take positive environmental actions often have no better understanding of the problem than those who don't act. In the United States, national opinion polls show consistently strong positive attitudes toward the environment, yet most of these Americans still won't do simple things to conserve energy and water. What does cause people to act? What can we as educators say or do to get people to behave in environmentally responsible ways?

I work as the project director of GreenCOM, the Environmental Education and Communication Project of USAID. GreenCOM was started six years ago by USAID to apply a set of marketing and communications techniques that have proven successful in the field of health to the field of environment. GreenCOM, has had the opportunity to make use of some of these new strategies in twenty-six countries. I would like to share with you both the theories behind the communications techniques that we used and our successes and failures.

Environmental Communications and Social Marketing

GreenCOM uses a form of "social marketing" that involves a simple five step process which we feel will bring about environmental behavior change. It is divided into sections corresponding to the five basic steps of social marketing (Day & Smith, 1996).



The Steps of Social Marketing for Creating Behavior Change

1. The first step—Assessment--identifies why the people you want to influence behave the way they do. People almost always have good reasons for doing what they do. They are not stupid nor are they often irrational. People need to be empowered to take action. Some small fraction of the audience may already carry out the behaviors we want a larger portion of the population to do. Knowing what people think and why they act the way they do can pinpoint a problem and identify the right way to solve it. What are the differences between doers and non-doers? When possible we want to build on what people are already doing correctly. We are looking for opportunities to develop appealing messages that make the desired behavior sound fun and easy. We are also learning what their sources of information are so we can select a medium for communicating these messages.

2. In the design and planning step, we take what we learned from the assessment step, compare it to our goals and budget and select the media we can afford that meet our needs. Based on what we learned about doers and non-doers we attempt to identify what might motivate people to stop or start a specific behavior – conserve water, dispose of items correctly, or whatever. When designing a message we try to remember to find an incentive for people to do (or not do) the behavior. Every person in one form or another asks, "What's in it for me?" Our message has to clearly answer that if we are going to bring about behavior change. Applied research provides insights into the benefits and barriers that people perceive about the proposed behavior. We conceive a message and prepare a draft script, storyboard, rough tape or whatever. But we do not

go into production.

3. In the pre-test and revise stage we actually test our draft campaign items with a small subset of the target audience. In one project GreenCOM worked on in Egypt, we took a draft message out to 40 people to see if the message was effective. (The tested message was the "experts" description of what people needed to hear rather than on the research.) We found that 39 out of 40 people which whom we pre-tested the materials did not understand the message. Pre-testing can save you enormous amounts of money and time.

4. After revising, and even re-pre-testing if necessary, its time to implement.

5. Monitoring and evaluation are critical. Changing behavior doesn't happen overnight. As people are exposed to new behaviors they often seek additional information. Campaigns need to be reworked to speak to those needs. Which media are being helpful or effective? Do we need to change the media mix? The graphic shows step 5 pointing back to a point between steps 2 and 3. Progress is made is a spiral with constant revisions, new pretests, and further evaluations.

Why should we focus on behavior?

Adopting this behavioral approach makes EE&C activities more focused and targeted, and ultimately more effective.

Resource users know best how rapidly their resources are diminishing. But they may not have the ability to correct the problem - they may need alternative specific behaviors, training in the skills to perform these behaviors, and then the opportunities to use them. Identifying the effective alternative behaviors will help identify the skills-training they need. For example, an Andean program attempting to stabilize agriculture and prevent encroachment into forest areas suggested that farmers limit burning when preparing the ground for cultivation. Farmers knew that biodiversity was affected by clearing more land and understood the importance of burning only the land they intended to plant. But they needed the skills to burn small patches of land in a controlled manner: skills such as opening fire breaks and burning into the wind. Training in these skills then supports environmentally friendly behaviors.

Environmental Education techniques work well in involving multiple stakeholders, organizations, agencies or individuals.

For example, urban waste collection involves several stakeholders: the waste generators, waste handlers, waste disposers, neighborhood associations, government technicians, elected local and central government officials, and residents. The solution to waste-collection problems needs to involve all these actors. Residents, for example, need to recycle, to reduce the amount of waste transported from the neighborhoods to the landfill.

Neighborhood associations need to promote recycling and help households transport their waste to a central collection point. This may require hiring waste collectors and charging for services provided to households. Drivers of municipal garbage trucks need to keep good records for their vehicles in order to prevent vehicle breakdown and avoid service disruption. Elected municipal officials need to obtain funds to increase staff assigned to waste collection. Identifying behaviors of each stakeholder helps to define action plans and distribute responsibilities accordingly.

Behavior is what people do. In the context of environmental education activities, "behavior" refers to a specific, voluntary action. People perform a host of environmentally appropriate and inappropriate behaviors everyday.

GreenCOM defines behavior as a single, observable action performed by an individual. Although the behavior may be performed by habit, it could also be the outcome of a conscious decision. *Behaviors* are distinguished from *practices*, which are a series of related behaviors. For example, correct agro-chemical use is an environmental *practice*, made of separate, observable, measurable *behaviors*. Behaviors associated with the use of Pesticide X may include:

- Storing Pesticide X out of the reach of children and animals;
- Using the correct amount of water to mix the pesticide;
- Wearing shoes that cover the foot while mixing pesticide;
- Wearing shoes that cover the foot while applying pesticide;
- Applying Pesticide X only when there is no wind.

When social marketers take on a communication challenge, they often first consider the context of the behavior. What real barriers stand in the way of people adopting this new behavior? (First and foremost, the behavior must be *possible*.) These are *external determinants* @ factors that affect performance of the behavior that are external to the individual. If recycling is not available in the municipality, it does little good to promote recycling behaviors. In comparing recyclers to others, some external determinants might be more obvious: Do recyclers live closer to the recycling center? Do they have a higher income, fewer children, or a flexible schedule that allows them to run errands when the center is open? Thus, all the elements that come into play when the behavior is performed are potential opportunities for the social marketer to alter.

A message could emphasize that the recycling center now stays open longer, or that new containers make storage of sorted recyclables easier. If time and convenience are the major barriers to recycling, the communicator might advocate a message that changes the perception of these determinants, such as, "it's not so hard; kids do it."

Clearly, the initial research to understand the audience and their context would need to cover questions that reveal their perception of barriers, the reality of barriers, and the incentives that motivate people (Kotler and Roberto, 1989).

What is the power of the media?

The media, that collection of opportunities for communicating with the masses, carry tremendous power. In the U.S., we have seen television episodes plant seeds of change in a nation's conscience when Maude (a popular character on a prime time show by that name) chose to have an abortion on prime-time TV and all of America began to debate the merits of legal abortions. Or when Fonzie, a street-smart teenager, on a show called Happy Days, got a library card and nearly one half million youth rushed to public libraries to get their cards.

We have also seen televised political debates sway public opinion after leading contenders falter. And we have seen powerful advertisements sell cars, toothpaste, and peanut butter. It is no wonder that environmental communicators seek to harness this powerful force aimed at informing and changing public opinion.

But often this power is quite difficult to use effectively. In some cultures, people are bombarded with over 3,000 advertising messages per day. What would make an environmental message stand out among that competition? Furthermore, environmental behavior is often a series of complex actions and opportunities. Is it realistic to expect a short message to make a significant change? Publicly broadcast communications reach the masses, but since the public usually holds a wide variety of beliefs and knowledge about any one environmental topic, it is difficult to reach the right group with relevant information. How can a message be crafted to communicate the right points to the proper audience?

Some people *love* communications work because it gives them a chance to be creative. Indeed, some of the most creative (and highly paid) media people work in the advertising industry. Environmentalists and environmental educators with a creative bent often grab the chance to work on communications. However, in our impatience to move forward, we often want to first focus on the media -- should we do a video or a website?-- and on the message – what should we tell people? But tons of research (as well as a number of very expensive failed campaigns) tell us that it is more effective to start with a clear goal, then really get to know the audience, including their concerns and where they get their information.

Communications has limits also. People often think communication works more quickly than formal education. Well that is sometimes true, but there is no magic wand. Even one time changed behavior needs reinforcement. Think a little about Coca-Cola. Virtually everyone in the world has heard of them. Yet, name the dates in the last 40 years they did not advertise!! If they feel they need to continue the process every day, why do we feel a couple of public service announcements will change everyone's behavior?

Building Communications Campaigns

Communications campaigns are varied, multifaceted, highly planned, and strategically assembled media symphonies designed to increase awareness, inform, or change behavior in target audiences. A model for designing communications campaigns uses these four steps:

- First, set a clear goal. What exactly do we want people to do? Which behavior do we want to focus on and why? Environmental practices often involve a myriad of behaviors. Which of these should be the focus of our efforts?

- Then select the audience that can have the most impact and focus on it. This is a research phase, which I will return to.

- Learn that audience's "media diet." What media does the target audience get its information from --radio, TV, newspaper, community bulletin boards, their doctor, boss, or children?

- Only then can we focus on message. A message written for a community bulletin board is quite different--and could be more effective in changing behavior-- than one written for TV.

These four steps: Goal Audience, Medium, Message must stay in order.

I encourage you to think about the power of communications in your work toward a sustainable future. The Tbilisi definition of environmental education calls for action component. Sustainability demands changes in behavior. With the right process I think you will find environmental communications helpful to your strategies.

Environmental Education in Asia and Beyond

Lectures

International Workshop on Environmental Education
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October 11-15, 1999

Learning and Teaching about the Environment

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There are a variety of ideas about how we learn new ideas. As our world becomes more complex, and as environmental issues and behaviors become more critical to the sustainability of our societies, it becomes more important to be efficient and effective in teaching people about the environment. Therefore, it could be helpful to review several popular concepts about learning. It may make us better teachers.

SELECTED MYTHS ABOUT LEARNING AND TEACHING

If someone doesn't know something, it makes intuitive sense that we could just provide the missing information. This intuition led educators to mistakenly think of children as "blank slates" or "empty vessels" to be filled with new information. The problem with this concept is that people are not "empty." Even young children have a variety of ideas about the world. Their conceptions – whether they are right or wrong – form a foundation upon which they perceive, accept, and reject additional information ( ). Rather than merely providing new information, good educators must discover what their learners already know and build on that with new information.

There are some facts about the world that it might make sense to memorize, such as multiplication tables. Memorizing usually means learning concrete, stable information. But there are other concepts about how the world works for which memorization is not the answer. Much about the environment is dynamic and fluid. It is more important for people to understand the concept and be able to apply it in new circumstances, to solve new problems. Memorizing the Laws of Thermodynamics, for example, is not sufficient to be able to explain its application. Particularly with regard to environmental issues, learning must be based on building understanding, not memorizing discrete facts (Kaplan and Kaplan).

There is a companion concept about learning for understanding – that effective learning is contextual. Concepts are better learned, understood, and applied, if approached within a specific context (Resnick). This is particularly powerful for environmental educators, because what we want to do – take youngsters outdoors and give them experiences, or build skills within the context of solving real problems – is indeed, the best solution. Real concerns within the community naturally lead to excellent opportunities for good education.

Educators have long believed that learning is an individual process; each student learns information on his or her own, in a quiet corner of their brain. But recent research has challenged this notion. Since humans are social animals, learning is a social process. We actually learn better in groups! It appears that during the process of discussing, comparing, challenging, and creating together real learning occurs (Johnson and Johnson).

Perhaps because it is easier, another myth is that learners are basically the same. It is easier for educators to cover information with a large class if they make this assumption. But unfortunately, each learner brings a different set of experiences to school, and a different personality. Some students find it easier to learn by thinking, others by talking, others by doing (Samples, Hammond, McCarthy). A good teacher will vary the teaching strategies to allow all students to learn in their most effective style.

Finally, a myth that will be with us for a long time, is that information changes attitudes and new attitudes will change behavior. This may be true if the only difference between two behaviors is a lack of information. If we can identify what information that is, we can provide it and change behavior. A study of recycling behavior in Ann Arbor Michigan indicated that the two groups – recyclers and non-recyclers – had similar attitudes about recycling and garbage, and even had similar understandings about why it is important to recycle (De Young). The barrier to recycling was a lack of information about *how* to recycle: must I put the newspapers in a paper bag; should I flatten tin cans; do I separate colored glass; which plastics are recyclable? Procedural knowledge is information, and this information is critical to establishing a new behavior.

But information is rarely the only important variable in behavior change. Other elements, like feelings of competence, perceptions of approval from respected members of family or society, disincentives like cost and inconvenience, and opportunity may be significant barriers to the new behavior and may override even the most heartfelt intention (Fishbein and Ajzen,). The challenge to educators who wish to change behavior is to consider how to build these elements into the educational program so learners can either figure out how to reduce the barriers, or understand that the barriers are not as great as they might be perceived.

TOWARD NEW APPROACHES IN TEACHING

If we take a moment to consider exactly what we wish to accomplish in Environmental Education for Sustainability, we quickly realize that memorizing facts probably won't be sufficient. We must create citizens who have the ability to:

- work with others effectively
- make good decisions
- adopt appropriate behaviors
- be motivated to make a difference

Each of these goals leads to designing an educational program with key ingredients. To learn to work with others, for example, one would emphasize cooperative learning strategies, where learns could gain communication skills, leadership skills, and responsibility as they discuss and work together.

To learn to make good decisions, people must have background knowledge in the issue, and be able to understand the issue from a variety of perspectives. These value positions may be difficult to convey, but ignoring the conflict could bring powerful accusations of "brainwashing" to the educator. Learners can also explore the consequences of each potential scenario, and learn how to accommodate uncertainty and risk. Finally, educators can give learners opportunities to practice making real decisions.

In those situations where educators wish learners to adopt new behaviors, an educational program can bring opportunities to experiment with new actions, to try, test, and evaluate the results. Examples of success stories, models, and examples can make it easier to conceptualize new behaviors, and see their results. Some behaviors may be generic to a variety of issues, such as data collection or letter-writing; others may be specific to a situation, like carpooling.

And finally, educators can help learners develop the commitment and motivation to act, by connecting the educational program with deeply held values, those things that people care about, such as health, independence, security, or family. Educational programs can also engage affective components of the learners by creating fun, magical, and exciting experiences; by using sensory experiences to reveal nature's mysteries; and by exploring ethics and justice in controversial issues.

TEACHING THEORIES USED BY ENVIRONMENTAL EDUCATORS

Several commonly used teaching theories embody these elements of effective learning in the context of our goals for Sustainability. This is not an exhaustive list of relevant concepts, but it provides a sense of the diversity in educational formats and strategies that we can choose from as we develop programs.

Working almost exclusively in the out-of-doors, Joseph Cornell uses *Flow Learning* to guide the development of nature walks and outdoor sessions with youngsters. He uses

the energy in the group to choose activities that awaken and excite or calm and focus learners. At the beginning of a session, for example, he might choose a guessing game to evoke a playful sense of adventure and create energy in the group. After increasing interest and excitement, the group is ready for a more focused activity that elevates their observation skills, like counting different bird sounds. At the third stage, he engages learners in an exploration activity where they experience an aspect of the natural world. Rather than a traditional nature walk, this phase also is an activity. In the activity "Cameras," for example, one child is a photographer, while the other is a camera. At the click of the shoulder, the camera's eyes fly open to snap a photo. In the last stage, learners reflect on their experience and share their feelings through a role play or pantomime, poem, or story (Cornell).

The Johnson brothers, David and Roger, have worked for several decades to perfect the art of cooperative learning. This is a teaching strategy that allows learners to work in small groups to explore a new idea, gather information, discuss ideas, apply concepts, and share experiences. In these groups, each individual may share information so the group can solve a problem. The group may write and produce a play to summarize a concept. Or, the group may conduct an experiment and observe the results. The key elements of a cooperative learning exercise are that it is structured, with individuals taking on roles to complete the task such as facilitator, recorder, or timekeeper; they group creates a product; and the teacher is free to assist all groups. Cooperative strategies may be as simple as "Think, Pair, Share" where students think on their own about the answer to a question, then find a partner, and share their ideas with each other.

Bernice McCarthy coined the term 4Mat Learning to explain an educational process of teaching information to the variety of learning styles. She also adds experiences and applications to provide the core of a learning unit. The 4-part circle that represents the 4Mat teaching process derives from two sets of learning processes: active to reflective and concrete to abstract and four types of learning styles: visual, auditory, physical or kinesthic, and symbolic. By moving through a sequence of 4 or more activities, teachers cover the same concept in all the different ways people learn. Students are introduced to the concept in a way that motivates them and connects the material to their world, information is presented through lectures or experiences, discussions help students compare ideas and imagine new scenarios, and students apply these concepts to a new situation. These strategies make sense given what we know about learning, but we haven't always known these things or connected them to the teaching process.

Many environmental educators have added together the elements of (1) identifying real world community issues, (2) practicing problem solving skills, and (3) conducting service learning projects and arrived at slightly different models serving very similar objectives. Harold Hungerford's students at Southern Illinois call it, "Investigating and Evaluating Environmental Issues and Actions. Elaine Andrews at the University of Wisconsin engages youth groups in the program, "Give Water a Hand." Educators around the world help youth collect data on water quality and share that information with others

through the Global Rivers Environmental Education Network, or GREEN. Earth Force sponsors a series of campaigns designed to help teenagers improve their community through environmentally responsible civic action. Bill Hammond in Florida named his program The Monday Group because students in different classes met together two Mondays a month. And Bill Stapp at the University of Michigan has called it Community Problem Solving. In most of these cases, students identify a local issue on which they wish to work, and then collect information about the problem, including various perspectives from opposing views and local experts. In time, they generate potential solutions, compare potential consequences, and choose a solution to implement. Here environmental education deviates from other problem solving programs. In some programs, students work to change their community by taking action. Students may write and lobby for a new community policy, survey citizens and make their opinions known, help raise funds to improve a community nature trail, increase awareness about a local endangered species and inform adults of appropriate behavior changes to protect habitat, and review transportation routes and establish bike lanes and bike racks at strategic places.

The possibilities to assemble engaging, interactive, meaningful, and effective educational programs are endless. Resources of simple classroom activities provide models of teaching strategies that may be adapted to match your teachers' and students' expectations and needs. Creative combinations of outdoor adventures, cooperative learning groups, and informative lectures may help all learners gain information. And community issues provide the rich foundation for learners to develop problem solving, communication, and action taking skills.

International Workshop on Environmental Education
in Asia and Beyond
October 11-15, 1999

Developing Environmental Education Programs for Sustainbility

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There is a long history in the United States of working to solve social issues through educational programs. During the Industrial Revolution, a nonformal educational institution—the YMCA--was launched to provide poor urban children with social opportunities to play, since many of them worked in mills and factories with their parents (Goodale and Godbey, 1988). At the turn of the century another educational movement began to solve the problem of young people leaving the rural agricultural regions of the nation to find work in the city. This "nature study movement" was dedicated to helping youngsters enjoy the mysteries and magic of nature (Comstock, 1911).

From driver's education to drug education, Americans have tried to reduce the problems of highway accidents and drug-related crime with well-meaning programs of teacher-led activities, classroom exercises, posters, and stickers. Some programs are amazingly effective; most are replaced in a few years with the next social problem.

Environmental education (EE), of course, is another educational movement that has its roots in this "solve problems by teaching kids" mentality. Since environmental problems have been a part of the United States for over 100 years, there have been many different versions of environmental education over the years. Fittingly, the concept of how and what to teach to solve environmental problems has evolved and changed as our understanding of the problems and solutions has grown.

The Dust Bowl of the 1930's, for example, transformed North America's overfarmed lands into wind-swept dunes, forcing many farmers to migrate to better territory (Swan, 1975). State and federal resource agencies responded with educational programs that promoted tree planting, water and soil conservation, and wildlife habitat restoration. Although some programs and materials were developed for adults, "conservation education" incorporated teaching materials, field trips, and classroom presentations.

Despite the existing opportunities of nature study and conservation education for teachers to introduce youngsters to resource issues, the American environment in the 1960s was far from healthy. Wildlife species were in danger of extinction, water pollution and air pollution threatened the human life in urban areas, and forest resources were disappearing from mountainsides.

It is not insignificant that this era was also a time of great social upheaval in the United States. The Civil Rights Movement, for example, made Americans question the fairness of laws and the ability of our government to make wise decisions. Rather than trust elected officials and corporate leaders to solve problems, American activists worked for opportunities for the public to be engaged in these decisions.

Thus, when environmental education was created, about the time the first Earth Day was organized, it was not merely an educational movement to teach information. It was also an educational movement to teach skills of political engagement, of decision making, and of problem solving (Disinger and Monroe, 1994). Social issues and environmental issues became linked, as urban issues like transportation and air quality became part of the EE menu. And unlike its predecessors, environmental education was not limited to school-aged children, but was appropriate for citizens of all ages – members of environmental organizations, voters, homeowners, and consumers.

Environmental education in the United States today incorporates and honors these elements of nature study, conservation education, and outdoor education, as well as the unique components of urban issues, action taking and citizenship education. By far the most popular approach to the environment for elementary teachers is nature and ecology study. But the most powerful and consequential programs are those in which students save their school money by conserving energy, or install public bike racks, or develop and implement a city ordinance to solve a local problem. They are working to understand local problems and implement solutions, taking into account social, environmental, and economic dimensions of the issue. Here environmental education meets education for sustainability.

Today, as environmental education blends with education for sustainability, new challenges are on the horizon but much of what we know about effective program design is still the same.

What Works – Developing Programs for Sustainability

Many people who develop educational programs have a knack for doing so. They instinctively know how to make information interesting and how to sequence events in an understandable pattern. If they took the time to think about what they do – they might have the following explanation:

Developing a program is a little like fixing dinner. First I decide what I want to eat, then I fix it, and then I eat it.

If we were to transform this analogy to program development language, first we create objectives, then we design the program, and then we teach with it. Many people do exactly this, and the programs reasonably good. But if we have limited resources and want

to assure that the program will meet the needs and be effective, we need to add a few more steps to the process.

If we were to raise the stakes for this dinner, for example, our hypothetical cook might have a slightly different pattern. First, although the cook must decide what to fix, it is also important to find out what the dinner guests wish to eat – do they have any allergies, for example? And, it is important to know what food is available – what is in season, what is in the cupboard? Knowing this information, the cook would create the menu.

During the preparation process, our cook would probably taste the food several times before it is served, allowing for adjustments of seasonings. A thermometer or timer might be additional tools to indicate that the cooking process is complete. When everything was right and ready, then the guests would eat. A really good cook might even appear at the doorway to make sure the guests were happy.

So our simple version of program development: Objectives >> Program Design >> Program Implementation has been accompanied by another strand that enables us to collect information from the audience and thereby know that this will be a "good" program: Planning Evaluation leads to Objectives; Program Design is accompanied by Formative Evaluation; and Program Implementation is followed by Summative Evaluation. All three types of evaluation are important for developing a high quality program, one that makes most efficient use of resources and is more likely to meet the needs of the audience and the environment.

Objectives →	Program Design →	Implementation
| |	| |	| |
Planning & Assessment	Formative Evaluation	Summative Evaluation

A great many people have developed lists of questions that should be asked during each phase of evaluation. Rather than review them all, I will highlight the suggestions that a group of international environmental education and communication practitioners made at a recent workshop (Monroe, 1999). Although there are many different ways to develop environmental education programs, these international participants believed the following suggestions help develop **successful** programs!

1. Effective projects empower local communities and use their expertise.

Projects succeed only with the will and support of the people. There are a variety of ways to involve local communities in a project, including assessing their situation and viewpoints, encouraging their suggestions, enabling them to make good decisions, and helping them to share in the program benefits. Productive and meaningful participation takes time. While it may be easier to "do it myself," it is usually more important to share these tasks and decisions with the people who must live with the outcomes. Real

participation, which converts decision-making power from the source to the people, is challenging yet critical to effective environmental education program development.

2. **Successful projects include scientific, social, economic, political, and cultural aspects.**

Environmental issues are nested in an interdisciplinary mix of scientific, economic, political, and cultural considerations. Therefore, successful environmental education and communication activities are designed to include a variety of perspectives. The latest in scientific and social science research may help inform the project in important ways. While sometimes difficult to achieve, it is important to involve people that represent a variety of ethnicities and social classes, and both genders, as well as a variety of professional expertise.

3. **In successful projects, a variety of stakeholders are identified and integrally involved.**

Successful projects bring a coalition of the stakeholders together to solve a problem, and these projects are designed to meet the stakeholders' needs. While it would be impractical for a large number of people to be consulted on every decision, successful projects invite stakeholders to participate in at least the beginning stages. Depending on the project, landowners, extension workers, teachers, curriculum developers, youth, elected officials, homeowners, farmers, and others can contribute appropriate insights. Understanding the issue from a variety of perspectives may result in changing the focus or audience of the project.

4. **Successful projects aim to instill or support an environmental ethic as well as to assist residents in developing decision-making skills.**

Projects are defined by the needs and resources of the local area, but whenever possible, successful projects move toward supporting an environmental ethic and developing decision-making skills. These aspects help communities participate in such activities as sustainable resource management, and help institutionalize a community's ability to identify and resolve environmental issues long after a project is completed.

5. **Projects that are successful include a gender component.**

For some years, policymakers have recognized that gender and environment are inextricably linked and that projects should formalize this connection. It is also important to recognize that women and men may have different, but important, perceptions, skills, and talents that need to be tapped for optimum decision-making on environmental issues.

6. **Successful projects are designed to be flexible and have a realistic timetable.**

Good projects take time, and sufficient time must be built into the project design.

As a project is implemented, the dynamics of the situation are bound to change; as skill building and education impact the community the community's insights on the project will also change. A successful project needs to be designed to accommodate these, and unforeseen, changes. If a project is to involve stakeholders, it must be designed with options for change, so that people's involvement can truly make a difference.

7. Effective projects are evaluated with appropriate tools.

Evaluation is critical to every project. Successful projects have a reasonable and meaningful match between the situation, the project goals, and the evaluation design. Sometimes the best outcome will come from the voices of the community members as they describe how their lives have changed through involvement with the project. Meaningful evaluation may at times be the number of people who receive a brochure; at other times it may be the commitment of the community to make change happen. Successful projects have measurable objectives that are relevant to the project's goals and feedback mechanisms to measure key variables throughout project. These objectives may not be identified in the proposal, but should evolve from the early stages of data collection and stakeholder participation.

Of course there are many different types of education and communication projects, each with their own set of important criteria, but these seven guidelines are generic tools for considering any type of program. They form a strong foundation for assessing existing programs and developing new ones.

These guidelines are further described in the small manual, "*What Works*" which you received with your registration packet. Details on the wide variety of program possibilities that can be created from this foundation are also included in the 41 case studies from around the world. Puppet shows, national curriculum, training for park guards, and street theatre are all possible outputs of environmental education and communication programs. Increased knowledge, supportive attitudes, and changed behaviors are the intended outcomes of such endeavors, and are indeed quite possible when programs are well designed from the beginning.

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Writing Proposals and Seeking Funding

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We know there is a tremendous need for educational programs to help move our societies toward sustainability. I imagine we could each name at least 10 specific audiences for whom critical information, specific skills and new educational opportunities could make a difference in their conservation attitudes and behaviors. Unfortunately for all of us, our agencies, organizations, and schools rarely have budgets adequate for all of the program development that is needed. Regardless of the national priority, the economic system, or spending opportunities, we tend to spend a great deal of energy scrounging for resources.

There are several ways to obtain resources, in almost every nation. In some cases, the best solution might be to develop partnerships with agencies and organizations which have funding and could benefit from an association with your project. The *Action Magazine* in southern Africa, for example, relies on funding from Ministries of Education in six different nations, and in return, produces a curriculum supplement that is locally relevant for the region. In other cases direct gifts from foundations or corporations or wealthy individuals might be appropriate. In each case, however, it is usually necessary for the people with the ideas to express them concisely and carefully so the people with the money understand their value. This means writing a proposal.

We do not pretend to know the all the answers when it comes to proposal writing and fundraising, but we do have some tips, some experiences, and some ideas to share. In this session, we will outline some of the strategies we've used to come up with ideas, write proposals, and find donors for funding environmental education and communication projects. We will present our experiences under two different points: Conceptualizing the Project; and Selecting a Donor.

Conceptualizing the Project

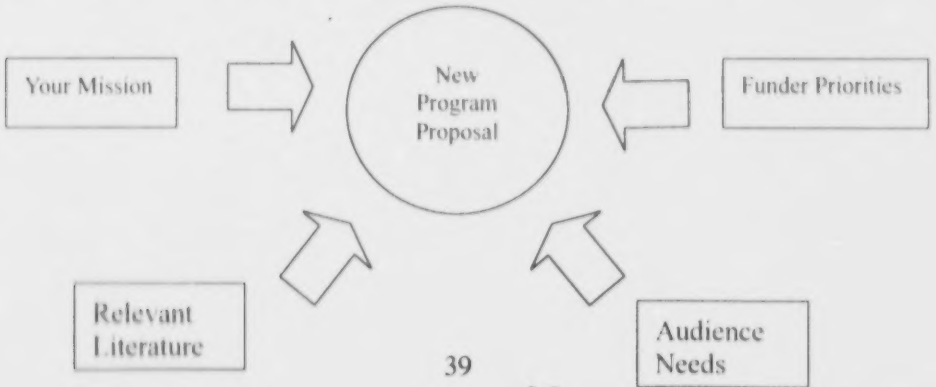
Most funders are interested in providing resources for new ideas that meet their priorities. It is extremely difficult to raise funds to continue tried-and-true programs, even though many of us wish to find funding to keep our good work going. Funders always prefer to fund something new, with measurable change or major impact. There are exceptions, of course, and it would be advantageous to search the databases and descriptions for sources of funding that match your particular needs. For the majority of cases, however, it is important to match your goals with their priorities and develop a project that the funder will be proud to sponsor.

In thinking about your project, you must be very clear about exactly what you want to do. You need to be able to state your goals so others can understand. If you can't, they

won't fund you, and perhaps they shouldn't. In describing what you wish to accomplish, it is usually helpful to convey the importance of the problem you wish to solve – so you should provide evidence of the need for this project. The more specific you can be about what you will do, how you will do it, who will help you with it, and what tools you will use, the more assured the funder will be that you have a clear, sound idea. If you know exactly what you will accomplish, you will be able to explain how you will measure the results of the project, and this will help explain to the funder what you will achieve with their money. Can you measure an impact? Has something new occurred? And finally, you should consider how you will continue the project when their funds are no longer available. Here you need to tell the donor how they will still reap the rewards of your long-term project from their short-term investment.

All of these questions and points should be explained in detail in the proposal your write or presentation you give to a potential funder. Being clear about what you will do is the key to presenting a solid project. The project should be explained, however, so that you can meet several different needs at once. You should be able to meet the funders' goals while still achieving your own.

The Laboratory of Ornithology at Cornell University provides several good examples. They sponsor research on birds. They are interested in exploring color morphology, population distribution, clutch size, and a variety of basic questions in the world of birds. They also know that the more citizens know about science, the more likely they are to make wise decisions about science-based social issues. And they are willing to develop educational programs to help learners understand science and birds. And so they begin to develop a concept of a new program – what if we could map out a science project that would involve students in collecting data that our scientists could use to answer our questions? And they did: Project Feeder Watch engages people across the country as they record who comes to bird feeders. They do seed preference studies and winter migration maps. But let's see how this concept evolves to meet the needs of a new funder. If our funder is interested in supporting real-world science and youth education in URBAN areas, all we need to add is an urban bird and questions that can be answered with kids' observations: Project Pigeon Watch. Youngsters in cities across North America have an opportunity to watch urban flocks of pigeons, record the color morphologies, note courtship behavior, and feeding hierarchies. Their data charts help scientists answer basic questions about color differentiation in one of the most common birds of the world.



The first step in conceptualizing your project is to understand the funder's priorities, and to build a project that connects your interests with theirs. You can learn about foundations and other funders by doing research in libraries. If their priorities aren't clearly evident, it may help to learn what types of projects have they funded recently and who is on the board of directors. By thinking broadly about what you wish to accomplish, and adding your understanding of the audience needs and relevant literature you should be able to generate several intriguing program concepts. Now you must be able to convey these project ideas in a particular way so that the funder catches your enthusiasm and shares your commitment to your mission.

Writing the Proposal

The key to writing a successful proposal is the ability to communicate your ideas clearly, concisely, and effectively. This usually means being specific and concrete, but this is not easy in a proposal. You need to be specific enough about program details to convey the idea, while not limiting yourself to changes that may be necessary. You need to be concrete about promising future outcomes, while not overcommitting your organization.

Most proposals have similar components. These components help a reader understand the vision for your program:

1. Summary or Abstract – It is best to write this section last, even though it usually comes first in the final presentation. It should be a very concise summary of the entire proposal: justification for the idea, why you are uniquely positioned to complete the project, what you will accomplish, and what resources you need for the job. Be sure to mention any priorities the funder wishes to support.

2. Your Organization – Why should someone give you money? This is your chance to explain your organization and build your credibility. Explain your mission, your history, and your accomplishments. Describe your experience with similar projects if that is helpful. List the key personnel who will be involved with this project and their qualifications. If you are working with partner organizations to help bolster your resources or expertise, be sure to include their descriptions here too. As enticing as it is to try to get funding, there should be a solid connection between what your organization does and the project. Don't try to get funding for something your organization may not be qualified or competent to do well.

3. Statement of Need – This section should describe the problem that your project will solve. You may cite the literature that supports your view of the problem and solution – this serves to let the reader know you haven't fabricated the problem and that you are well informed about the issue. Reinforce the connection between your organization, the problem, and this project. Be specific about who you can help do what: geographic, social, or economic parameters may help delimit the scope of your project in helpful ways. It may be particularly helpful to refer to needs assessments or exploratory planning that helped to define the problem and support your project idea.

4. Project Goals and Objectives – Finally, arising directly from the problem and your expertise, this section should explain the project's goals. The goal statement should provide the overall vision for the project; the objectives should list very specific things you will accomplish and measure. Your objectives can specify product outputs: *Publish 500 copies of teacher manuals*; or behavioral outcomes: *Teachers will be able to lead groups of students investigating local issues*. Consider your evaluation plan as you craft your objectives and define your project. What changes do you want to accomplish? What can you measure that will be reasonably accomplished by this project? Write these as objectives.

5. Project Description – Use this section to provide some detail about how you will accomplish your project. Who will do the work? How much time will it take? What resources will you use? What strategies will you use to meet your goals efficiently? In this section, the more detailed information you can provide, the clearer your project will be to the funder. Anticipate the types of questions the reader may have and answer them. What will happen to this project when this funding is over? What is the long-term future of this project?

6. Evaluation – Every proposal must have an evaluation plan. Many funders are anxious to know how you will make sure their resources are being used wisely and effectively to meet the goals. Evaluation efforts can help launch the program with an assessment of the audience's knowledge and attitudes, can help improve the product with a pilot test of several samples, and can help confirm that the objectives were met at the completion of the project. Think creatively about using indicators of success to measure long-term changes.

7. Budget – Here you must estimate your costs of doing this project. If existing staff will do the work, consider including a portion of their salary in the budget, if allowed. Don't forget legitimate expenses like telephone calls, copy charges, and travel expenses. Consider what you need to convert this idea to reality. Although you may be tempted to overestimate expenses, be able to justify them. Most funders will ask for an explanation of each item in the budget. Inflated numbers are not likely to win approval. It is important to learn how the funders want budget information. Do they require matching funds from other sources? Do they allow in-kind contributions? How should you explain partner resources?

8. Appendix – If allowed, this is your opportunity to add letters of commitment from partner groups, letters of support from audience groups, resumes from key personnel, examples of similar work your organization has done, etc. Most funders do not want to receive books of information, but they do want to know this is a serious effort to meet important needs.

In each section, be as brief as possible while being as thorough as possible. Use powerful words and sentences to get make your point efficiently. Try writing as you would speak if that helps.

To get started with a proposal, try the following trick: Imagine you have

completed the project and are watching the program unfold. What do you see? Who is attending? How many? What do you hope they will say in response? Imagine you are speaking to a reporter who is asking Who What Where When Why and How? What are your responses? Use this imagery to describe your project in very concrete details. Similarly, imagine what you want to tell the funder in your final report. What are your greatest successes? What did you learn about doing this work? What do the participants say about the way this program has changed their lives? Convert these thoughts into measurable objectives for the proposal. This version of "time travel" can be quite helpful in proposal writing, as you are describing something that hasn't happened yet as specifically as if it had.

Finally, follow the funder's guidelines for the proposal. Do not exceed the specified length on any section. Use reasonable margins and font size. Proofread the proposal to check for grammatical errors, and also have an outside person read it to make sure it is easy to follow and understand. Use the subheadings requested by the funder; it will make the proposal easier to score by the reviewers.

Selecting a Donor

With a well-written proposal in hand, about an idea that both you and the funder should care about, you are ready to start selling the concept. It helps to learn more about the grant-making procedures for your chosen funder. Do they require an introductory letter? Do they have established dates for reviewing proposals? If this information is not common knowledge, make contact with them right away and ask. They should be happy to speak to someone who wishes to follow their directions!

If you have not yet found a potential donor, you can begin the search on the World Wide Web. Private foundations, multi-lateral development donors (World Bank, United Nations, etc.) bi-lateral development donors (USAID, GTZ, CETA, JICA, SETA, etc.) and even corporations have websites that clarify what they prefer to support, how to seek funding, when to apply for funds, and the level of resources they provide. Even large international conservation organizations (IUCN, WWF, etc.) sometimes have funds available for specific projects, and much of this information is on the web.

Before you knock on doors, take some additional time to think about how your project will become sustainable after their initial funding. Will this project increase membership or provide organizational support such that the organization could continue to fund it? Are there larger organizations, such as a university, public library, school district, or local government that could support the project because it helps meet their needs? Can this project be developed by a public-private partnership which could lead to continuation through the private sector? If you can demonstrate local commitments to continue the project, you might have a better chance of being funded for the initial investment.

When your selected donor has been identified, introduce your idea through appropriate channels (a meeting, a letter, or a proposal) and don't be afraid to emphasize

the elements of your project that meet their priorities. Stress how this project achieves an important goal while also targeting other key trends, such as providing assistance to disenfranchised populations, protecting biodiversity, coordinating several partners, or solving controversial issues.

Let the funder know that you have done your homework and understand their mission and priorities with your questions and comments.

If your proposal is rejected, make the most of the opportunity by asking how it could be improved for the next cycle, and if they know of other funders who share your interests. In time you will build a network of people who care about these issues.

DRAFT WORKSHEET ----------

Consider your proposal idea. Describe it in a sentence, mentioning the key problem it helps to solve:

Find a partner. Each of your will act as a journalist, trying to write an article about your project as it is being completed. Answer the questions as if the project evolved perfectly. Write down your comments about the participants, the project, the partners, the results, and the changes this project brought to the community. Explain what problem you are solving, and who you represent.

Use your notes to describe your project. What will it accomplish and how will it happen (section 5).

Describe the problem and the need that this project meets (section 3).

Describe who you represent (section 2).

Now imagine your evaluation. What will you measure? What do you want to find out? What tools will you use to measure these things? As you consider these questions, write a brief explanation of your evaluation plan (section 6).

Use your evaluation plan and your project description to write your objectives. Be very clear. Specify who will do what, by when, with what provocation. Make sure you can measure each objective in your evaluation plan (section 4).

Now develop your budget. Can you accomplish this project within the budget limits of the funder (section 7)?

You have now started to develop each component of the proposal. The only thing left is the summary. Looking over all your notes, write one complete paragraph that explains the key ideas (section 1).

International Workshop on Environmental Education
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Tips on Evaluation of Environmental Education Programs (1)

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OBSERVATIONS

A DEFINITION

Observation is a data collection method where incidents and behaviors are described in relation to social and physical context. In education, observing a program is like ground-truthing in geography. With this method of collecting data, the evaluator records what happens when the group participates in the education activity on-site. By watching, listening to, and noting the setting, the behaviors, interactions and reactions of the staff, students, and educators, the evaluator can create an observational understanding of what took place. Observation provides a way of inferring competence by performance.

Observation usually consists of a narrative of a sequence of events, a record of what participants said and did, with duration and description. It can also include counts, such as how; many times something happened or how many people performed an action.

Participant observation refers to observations noted by someone who is actually participating in the activity. The evaluator interacts with the program participants and experiences the program as a participant. At the other end of the continuum, non-participant observations are made by observers attempting to be as unobtrusive as possible, avoiding interactions with the subjects being observed. The evaluator watches as an outsider to the program, with an external viewpoint.

Covert observation differs from overt observation according to whether the subject knows when he or she is being observed. For covert observation, the observer may be watching through a hidden camera or a one-way window. The benefit of this method of observation is increased validity: the observation doesn't affect the subject or change the behavior being observed. Covert observation, however, raises some ethical questions. In overt observation, those under observation know they are being watched and are aware when the observer is present. The risk is that awareness that one is being watched may alter the behavior being watched.

ADVANTAGES AND DISADVANTAGES FOR OBSERVATIONS

- It can be hard to remain objective as an observer.

- What happened is described subjectively, through the eyes of the observer.
- Observation does not usually provide an understanding of how the participants view their behavior.
- The observer's presence may affect the program.
- Observations must be conducted at specified times in specified places.
- Each observation is usually fairly time-consuming, and potentially costly.
- Usually data collection is limited to a small number of observations.
- Usually an observation represents only one small slice of life of a program.
- Replication is very difficult.
- On the other hand, the person who has seen the program in action has some idea of what's being evaluated, of what is actually happening, a more in-depth view.
- Observation can avoid the biased self-reporting inherent in interviews of program presenters or participants.
- The observer's presence may improve the quality of the self-reported data.
- The observer's presence may improve the quality of the education being evaluated.
- Seeing what happens gives a context that enhances understanding of interview or survey responses.
- While much of the data can be summarized qualitatively, in the words of the subjects, some aspects can be quantified and tallied.
- While observations may be most useful for formative and summative evaluation, they may serve to find out what exists and what's needed at the front end too.

TIP FOR CONDUCTING OBSERVATIONS

- Review the purpose of your observation and identify program objectives to be measured before setting up the observation.
- Determine what aspects of the program and what actions/interactions to observe.
- Begin by making broad, descriptive observations, then narrow the research to focused observations and, eventually, selective observations, while still continuing the overall descriptive record.

- To be an objective, non-participant observer, avoid involvement in the activity being observed.
- Define your role ahead of time to the facilitator/educator conducting the program/activity you are observing.
- Be sure to obtain permission to observe in advance.
- Relate the observation to the needs or values of the facilitator/educator and emphasize benefits of participation in the evaluation.
- Reassure participants and educators that you are evaluating the program, not them, if that is the case.
- Always remember that you are a guest in the educator/facilitator's program.

- Thank your host after the observations.

Note the setting, **where** the activity/program takes place, the physical space, the learning environment, and resources that are evident.
Note **conditions** that might interfere with or foster the success of the program.
Note **who** is involved in the activity being observed, who is not, and who are interacting.
Note **what** is happening; what people are doing and saying, what stimulus and response.
Note both **usual**/ordinary/regular and **unusual**/extraordinary/irregular events.
Note **when** things happen, what time of day, duration, sequence, and frequency.
Mark the **time** when the program starts and whenever there's a change in the program or transition to another phase or activity.
Note **how** participants behave, interact, react, connect with the program or activity, the leader/educator, and each other.

- Keep judgments and interpretations separate from descriptions of what you observe.
- Write descriptions of what's happening during the activity, but write reflections and interpretations after observing the activity.
- The process of transcribing observations may help you distinguish between what you saw and what you think you saw.

- Maintain awareness that you can't observe everything without missing something.
- Tape recorders, video cameras, or still photographs can serve as data to aid your memory in analyzing findings and your presentation of results.

DEFINING FOCUS GROUPS

A focus group is a group interview, usually lasting 1-2 hours, where the moderator ocuses the discussion on matters of interest to the researcher/ evaluator using predetermined,open-ended questions as a general guide. A technique born out of marketing research, it is useful for front end, formative, or summative evaluation. The discussion is usually recorded for reference. Focus groups are useful to explore a range of ideas, but reaching consensus is not usually the purpose of the discussion. A qualitative approach to obtaining information from specific groups, focus groups can provide information including beliefs, opinions, attitudes, perceptions, and feelings, however, the opinions expressed in the group may not apply to the larger population.

ADVANTAGES AND DISADVANTAGES

- Focus Groups are relatively quick and inexpensive.
- A focused discussion can be more flexible than a written survey.
- More opinions may be heard in less time than in individual interviews.
- Respondents may stimulate each other to express things they might have forgotten

individually.

- The focus group may serve to educate the participants or may promote the program being discussed.
- Focus groups work well to generate hypotheses when little is known, thus they can be used to develop questions for a written survey.
- Focused discussions are well suited for uncovering human perceptions, opinions, and attitudes.
- A focus group can provide detailed insights on a specific topic.
- Focus groups may be appropriate up front, during formative or summative evaluation.
- Findings are usually in a form that's easily understood: a summary of the words of the participants.

- The total process may involve more time than simple quantitative procedures.
- A skilled moderator is required.
- The findings depend on the willingness of the participants to share their views in the group.
- A specific setting is required and a scheduled time.
- It is hard to replicate a focus group.
- Groups can vary considerably and many more groups may be needed to balance the idiosyncrasies of individual sessions.
- Usually the group has some homogeneity and is not randomly selected; participants are not numerically representative of a larger population, so caution must be exercised in projecting results to a wider group.
- Some subjectivity is involved in the interpretation of the discussion.

TIP FOR CONDUCTING A FOCUS GROUP

- Decide which elements of your program are best evaluated using focus groups and in which time frame of your evaluation they fit.
- Select a person skilled in group process to serve as moderator and an assistant to take notes and operate the tape recorder.

- Choose a site and time convenient to the participants.
- A site that will be perceived as objective, unbiased, not connected to the program being evaluated may be desirable in some circumstances.
- Set up the room with chairs in a circle or square so everyone can see everyone else.

- Select participants from the desired populations.
- Contact participants, send a confirmation letter, and call the day before as reminder.
- Provide incentives such as cash.
- Plan seating so dominant personalities are near the moderator, shyer speakers directly across from the moderator.

- Provide a snack to help get people socializing, but try to avoid lots of clinking glasses, etc. during the recording of the discussion.
- Use a tape-recorder with a free-standing microphone; request an extension cord; travel with batteries; and practice using the tape-recorder in the room ahead of time.
- Let participants know about the recorder in a non-threatening way, reassuring them that their names will not be used in any written report.
- Label your tapes immediately.
- You can have the tapes transcribed word-for-word afterwards.

- Plan a limited number (3-6) of open-ended questions ahead of time, requesting reviews and helpful ideas, then ask the questions to a few individuals from the targeted population (but not from actual focus group participants.
- Start with an introductory question and move to the meatier ones.
- Draft probing questions to draw out information following each general question.

- It is the role of the moderator to set the stage, introduce the group, ask the questions, and make sure everyone has opportunity to speak.
- Allow for the pursuit of tangents during the discussion, if the information may prove relevant to other questions.
- The assistant moderator usually sits to the side, takes notes, and operates the recorder.
- Be sure to thank participants and provide remuneration as promised.

- The moderator and assistant should compare perceptions after the discussion.
- Review the tapes and summarize each question, including a few quotations and adding a paragraph interpreting the findings. Delete names of participants from the report.

International Workshop on Environmental Education
in Asia and Beyond
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Tips on Evaluation of Environmental Education Programs (2)

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SURVEYS AND FORMS

DEFINITION OF A SURVEY

A survey is a written set of questions to collect information from respondents. That information may be used to describe, compare, or explain knowledge, attitudes, and behaviors. The survey may be conducted orally where the interviewer (in-person or by telephone) records answers in a specified manner, or may be distributed on paper.

Surveys can be used to **describe** a population – find out what they know, how they behave, what they want, what they like, etc. Surveys can also be used to **compare** two or more populations, thus exploring which program works better, which group learns more, which topic better meets the needs, etc.

ADVANTAGES AND DISADVANTAGES OF A SURVEY

- You can reach a large number of people with one document.
- Quantitative responses may be tallied easily.
- A few qualitative questions can be asked to help explain the data.
- It can be used in all stages of a program evaluation to collect information.
- It can be completed on the respondent's own time.
- It can be administered randomly.

- You are stuck with the questions you distribute. You can't offer further clarification once the survey is out of your hands.
- With closed questions, you have no way of knowing what the respondent was thinking and if your interpretation of their response is what they meant.
- Questions may be misinterpreted or improperly answered, and you may never know.
- It is critical to take the time and effort to pretest the survey questions.
- Not everyone will respond. You may need to find out if the respondents differ from the non-respondents in a meaningful way.
- Results are completely dependent upon the quality of the questions.

TYPES OF QUESTIONS

Open questions allow respondents to answer in their own words. They are most helpful when examples, explanations, and experiences are sought, or when it is important to have the respondent answer in their own words, through their perspective. Responses may be challenging to compare or summarize, and more than a few such questions may be tiring to complete.

Examples:

What do you like most about your experience today?
What are the three most important things to take on a field trip?

Closed questions provide the responses. The respondent merely checks the proper box to answer the question. These responses are more easily tabulated, but unless they are carefully pretested, may provide misleading or incorrect information. There are many different types of closed questions:

Two-way Questions Yes/No or True/False. They are easy to score and fairly easy to write. They limit the respondent to the extremes of the scale and may not adequately reflect their feelings or interest. It is easy to guess the "right" answer.

Examples:

Have you enjoyed this program	[ ] yes	[ ] no
Soft serve ice cream is made from trees.	[ ] true	[ ] false

Categorical Questions Responses are in mutually exclusive categories. The list of responses gives respondents some choice; they are easy to score, but if the choices are not appropriate, the results will not mean anything. Categories should be exhaustive (you don't want to have the majority responding as "other") and meaningful to your evaluation.

Examples:

What is your gender? Male [ ] Female [ ]

Which National Parks have you visited?

___ *Yellowstone National Park*
___ *Shenandoah National Park*
___ *Harpers Ferry National Historical Park*
___ *Great Smoky Mountains National Park*

How old are you? (For a survey to explore how teenagers respond to an exhibit)

[ ]	5-8	[ ]	9-11	[ ]	12-14
[ ]	15-17	[ ]	18-20	[ ]	21-30
[ ]	31-40	[ ]	over 41		

Matching Questions Respondents match a concept with a definition, a species with a season, a picture with a term, etc. These are easy to score as there is a "right" answer and can test respondents without being threatening. Responses are limited and may not be

the appropriate level of challenge for your group (could be too easy or too difficult).

Example:

Match the animal on the left with the category on the right by writing the letter (a-e) in the space next to correct animal.

Animal	*Category*
___ *bat ray*	*a. mammal*
___ *sea otter*	*b. bird*
___ *brittle star*	*c. amphibian*
___ *brown pelican*	*d. fish*
	e. invertebrate

Numerical Questions Responses provide numbers that reflect real values. It may be difficult for people to know the correct number; they may guess or provide the number they would like to be true (age and weight questions in particular!). Consider if you need the exact data or if a category is sufficient.

Examples:

How old are you today? _____

How tall are you? _____

How far did you drive to arrive here today? _____

How many of the following brands of pizza have you tasted? _____

ORDINAL, ORDERED QUESTIONS OR RATING SCALES

Responses are provided in a numbered (or numberable) scale, but the intervals may vary from person to person. Allows respondents to reply to questions that involve a value:

- Strongly agree, agree, neither agree nor disagree, disagree, strongly disagree
- Always, very often, fairly often, sometimes, rarely, never
- Excellent, very good, good, fair, poor
- Completely satisfied, very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied, completely dissatisfied
- Very interested, interested, somewhat interested, a little interested, not at all interested

1. Make sure the content of the choices match the question. Do you want to measure intensity, frequency, interest, endorsement, or compare two products?

2. Try to use about 5 choices; no more than 7. Self-administered questionnaires are fine with 4 or 5. You want to create a large enough "spread" to get variation.

3. Points on the scale should fall in about equal intervals, with the end points being equally intense.

4. A neutral mid-point may be helpful, or may provide an easy out for respondents.

5. An "I don't know" option is helpful for certain complicated questions, but NOT in the midpoint!

6. Keep similar scales oriented the same way on the survey; 1 = lowest, least, not; 5 = highest, most, very

Example:

How interested are you in receiving the following, where 1 = not interested and 5 = very interested:

poster on biodiversity	*1 2 3 4 5*
class activity book	*1 2 3 4 5*
coloring book	*1 2 3 4 5*
PBS video tape	*1 2 3 4 5*
guest speaker	*1 2 3 4 5*

Ranking Questions These can be an excellent way to get clear results on the three most important items, or priorities for short lists. They can be difficult for people to complete, especially when the list is long.

Example:

Please order the following list with 1 = your first choice; 2 = your second, and 3 = your third for teacher inservice training:

___ Saturday workshop; __ Evening workshop; ____ Summer workshop

DEFINITION OF INTERVIEW

An interview is an in-person or on-the-phone conversation with a respondent. It differs from a spoken survey in that the questions tend to be open-ended, eliciting feelings, explanations, opinions, and histories. A set of interviews may help clarify what participants are doing or thinking as they engage in your program. Interviews can be employed in all three stages of program evaluation to discover how individuals react to the program. They can be performed with individuals or groups (focus group).

We can categorize interviews into four subsets, they can be combined in the real world.

Informal conversation – a spontaneous generation of questions, often as a part of on-going field work

Interview guide – a set of questions or issues guide the interview, though they may

be altered and provided in a unique order each time. It is focused but not limited.

Structured, open-ended – a set of carefully worded questions that are used consistently with each interviewee, minimizing interviewer effects.

Closed, quantitative – a survey given orally.

ADVANTAGES AND DISADVANTAGES OF INTERVIEWS

- Questions can be adapted as difficulties in interpretation arise for future interviews.
- Less structured interviews allow for new information to surface.
- Interviews can elicit orally more information about feelings and impressions than people would care to write down.
- Interviews can obtain wonderful, quotable statements.
- People can respond in their own words and are not forced into predetermined categories.
- It is often easier to interpret what the respondents mean, since clarifying questions can be asked and they explain in their own words.
- Interviews can be used to deepen understanding of data collected via other tools (e.g., pretesting a survey, confirming numeric trends).

- Somewhat limited in terms of the numbers of people that can be interviewed.
- May see variation in results if interviews are conducted by more than one person.
- If using a less structured approach it may take a great deal of time to get systematic information.
- It may be challenging to analyze open-ended data.
- It often involves more time per individual than a survey.

TIPS FOR CONDUCTING INTERVIEWS

- Hold the interview at a site and time convenient for the respondent.
- Allow plenty of time between interviews to allow the first to finish completely; do not schedule them too tightly.
- Establish yourself with some credibility and purpose, so respondents aren't nervous about why you are asking a question and how you will use the information.
- Conduct a purposeful sample based on what will be useful to your project. It may be sufficient to interview until little new information is uncovered. Identify who to interview based on who can provide the most helpful or most typical information.

Designing Interview Questions

- Move from the general to the specific.
- Move from concrete behaviors to rationale.

- Avoid "why" questions, since the respondent often does not know. Try to word the question to tease out what the respondent can talk about, perhaps "how did you feel."
- Use "true" open ended questions.
- Determine what demographic information will be helpful and scatter these questions throughout, or leave them for last.
- Use simulation questions to probe sensitive areas.
- Pre-test the interview questions with several people who can give you meaningful feedback.

During the interview

- State the purpose, approximate length, and ask permission to record the conversation.
- Provide assurance of confidentiality, and how results will be used, if relevant.
- Establish rapport with the respondent, while still remaining neutral.
- Provide positive feedback about the interview, "this is very helpful."
- Use the interview questions or guide, and ask follow-up probes to elicit clarifying information.
- Don't lose control of the conversation with wordy respondents.
- Complete the interview by asking "what else would you like to add?"
- Summarize the respondents main points to check for validity.

After the interview

- Immediately make your notes about comments and reflections that weren't recorded.
- Try to transcribe the interview within 3 days. It often takes three times longer than the interview.
- Taking notes may be sufficient rather than tape recording to collect data from an interview. Leave space on your question guide for answers, and don't feel bashful about asking the respondent to slow down while you write down that important point.

WHO CARES? WHO LEARNS? WHAT DO THEY LEARN?

Using an Evaluation Tool to Get Answers

Identify the stakeholders in this real case study, then consider what tool you would use, and what questions you would ask of whom.

THE CHILDREN'S GROUNDWATER FESTIVAL IN NEBRASKA

For over 8 years the Groundwater Foundation has sponsored an annual one-day event: The Children's Groundwater Festival in Grand Island, Nebraska. Over 3,000 students and teachers attend a variety of sessions to learn about groundwater and the

environmental threats to its quality. Pre- and post-tests confirm that student knowledge about groundwater, its conservation, and its protection increase by an average of 21%. There is broad agreement that the festival is successful, fun, and meaningful, but the sponsors wondered what information is retained over the long-term and how the Festival impacts participants' water-related behaviors.

❖ Identify the stakeholders in this program:

❖ And, what general questions should be asked of whom?

❖ In order to say "kids learned something from this program" the best evaluation design would have some kids receiving a "treatment" and others who don't (the control). What would make a good control in this case?

❖ How could you measure long-term impact and behavior changes?

❖ What are the disadvantages of a survey? What are the advantages? What other tools might be used in this case?

THE GROUNDWATER FESTIVAL EVALUATION

A Study Conducted by The Rensselaerville Institute

In 1994, the Groundwater Foundation, through a cooperative agreement with the US Geological Survey, undertook an assessment project to determine how effective the Children's Groundwater Festival education programs have been in influencing behavior changes, both short and long term, in participants. The festival attracts over 3,000 4th, 5th, and 6th grade students and their teachers for a day of various learning opportunities and challenges. Each event runs for 30 minutes, so students are exposed to a wide variety of presentations styles during the day. The evaluation project was specifically designed to gain a "snapshot" depiction of the Festival's effectiveness to date in influencing behavior change in students, and discern what common changes in behavior have occurred as a result of attending the Festival.

The study used self-reported information from students and teachers in focus groups and interview sessions to ascertain changes in participant behavior that may have occurred as a result of attending the Groundwater Festival. The evaluators also observed the festival to generate suggestions for improving the format to increase changes in participant behavior. Students and teachers from over 15 secondary schools participated, and were divided into the following groups:

- students who attended the most recent festival
- students who attended at least one festival 3-6 years ago (a total of 28 students in 5 focus groups)
- teachers who attended at least one festival (14 teachers)
- control groups of students who had not attended the festival from schools that did and did not participate (16 students in 4 focus groups)

Focus group questions for students who attended a festival included the following:

- How long ago did you attend?
- Do you remember any one or two particular Festival events that really impressed you?
- Do you remember anything you did differently as a result of attending?
- Do you continue to do any of those different things?
- Did your teacher do any special lessons before or after the Festival?
- What suggestions do you have for organizers to improve environmental behaviors of participants?

And for students who did not attend, the questions were slightly different:

- Have you had any classroom lessons on the environment, its protection and conservation?
- Have any of your personal behaviors changed because of any environmental information you've gained? What in particular really influenced you to change?
- What information would you have to receive to get you to practice water conservation? Do you think conserving water is important?

Observations of the 1994 Festival drew these themes:

1. The kids love the Festival. They are an eager and captive audience. They do wear out during the course of the day; in morning sessions they are more attentive.
2. If you want kids to change their behavior as a result of the Festival, a core set of messages must be communicated to every participant. In the current Festival, it is not clear what those messages are or if every participant is hearing them at least once. It may be helpful to rate various sessions "introductory" and "advanced" and make sure that all groups get the introductory sessions in the morning.
3. Some presenters are better than others. The Festival organizers may wish to train presenters and provide suggestions on improving their session.

4. Students range in their level of groundwater knowledge coming into the Festival. It may be helpful to assure that teachers have completed a basic introductory unit prior to attending.

Focus group interviews with student reveal the following:

1. Students attending 3-6 years ago still remember some specific events, some because they were fun (the concepts in these activities are less clear), some because they had a strong impact.
2. Students who attended the festival felt more attention should be paid to environmental issues and conservation than is at present. Students who did not attend felt that enough or too much attention is currently given to environmental issues.
3. Maintenance of behavior changes over time was inconsistent among Festival participants. Many students could list some changes and fewer said they still practice such behaviors (e.g., taking shorter showers, minimize use of lawn pesticides, recycling).
4. Students had many practical suggestions for organizers: avoid lecture sessions and make them hands-on; hold a festival for parents; make sure teachers prepare students and follow-up with additional activities; have a festival for older students; partner with existing organizations to provide a structure and support for long-term changes; tell students what *they* can do to protect groundwater, not what farmers can do.

Recommendations for the Festival offer some interesting suggestions:

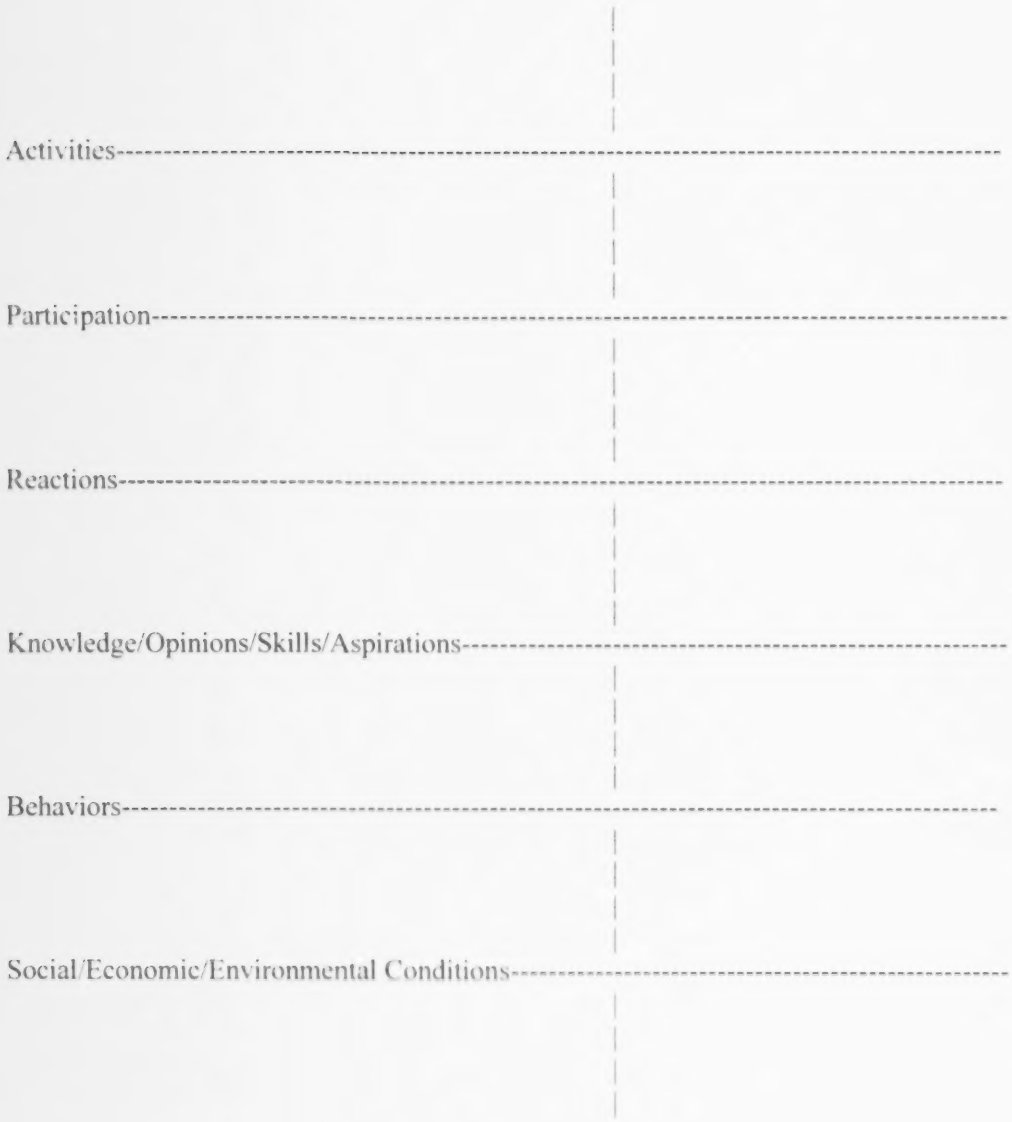
1. The Festival, despite its short duration, creates some lasting impressions. Each session should be examined to see how to make its message more memorable.
2. The Festival may promote short-term behavior changes. Creating durable behaviors may require support from family, teacher, or community groups.
3. Parents, an important ingredient in the behavior change formula, should be involved in the Festival; perhaps a Parent's Night would be possible.
4. Memories and understandings may be stronger in the long term if facts presented during the Festival were well integrated. Connections between issues and the relevance of each fact to groundwater protection should be stressed.

PRACTICE WITH BENNETT'S MODEL

Think carefully about the education or outreach program that you could evaluate at your own site. Use the following chart to identify the objectives at each stage of Bennett's hierarchy and the ways you could evaluate progress in each area – how do you know you have achieved your goal at each step. Not all steps may apply to all programs.

What will you accomplish? **How do you know?**

Resources----------



COGNITIVE MAPPING

This evaluation tool is sometimes used to find out what people have inside their heads – how they think about a topic. It can be used during a needs assessment process to explore what people already know about a topic and how a program should be developed. It can be used as a summative tool to assess how much they learned. There are several different versions of this tool. One provides people with a set of topics; another asks people to generate the topics. Here is how they work…

1. Let's say you want to help elementary teachers do a better job of teaching about animal classification, a common element of life science classes. You could begin by asking them to list a set of animals they would teach kids (each name on a different card), or you could give them a set of cards with the names of animals on each and ask the teachers to discard the animals with which they are not familiar. In either case, each participant now has a set of cards of animals.

2. Next, each person groups the cards into groupings that make sense to them. After all the animals are categorized, ask each person to label the categories.

3. You can also ask people to identify the characteristics of each group and what makes each animal belong there.

4. The two-dimensional map-like structures that result from this exercise help explain how each participant categorizes animals, how they identify similar animals, and how they might teach youngsters about these relationships. You can code the maps by noting how many animals are included, how many groups are created, the strength of the categories (are they exclusive?) and the accuracy of the group labels and groupings.
This technique was used in a college-level pre-service biology class. Before instruction, some of the categories were:
Person A identified her own animals and categories:

Birds: robin, duck, chicken, sparrow, pelican
Domestic animals: dog, cat, rabbit
Reptiles: lizard, alligator, iguana
Wild Animals: monkey, lion, giraffe, bear, zebra

Person B was given animals and put them in categories:

Big Salt Water: humpback whale, white shark, bottlenose dolphin
Birds: red-tailed hawk, turkey vulture, common raven, cardinal
Furry Common Animals: opossum, woodchuck, red fox, brush rabbit
Reptiles other than Snakes: chorus frog, western toad, box turtle
Water Paramount: crocodile, penguin, polar bear, penguin

After analyzing the "maps" of several classes of students, the instructor noticed some patterns in how pre-service teachers think about animals.

1. Snakes tend to be a category until themselves
2. Amphibians and reptiles other than snakes tend to be lumped together
3. More common animals and birds tend to be a category
4. Whales, dolphins, and fish tend to be grouped together

After instruction, student categories reflected the standard categories of five vertebrate classes, though some errors were persistent, particularly between small reptiles and amphibians (salamanders, turtles, lizards).

Now you do it...

You can see your own cognitive maps in how you think about certain topics. Think about something you know a fair amount about – wetlands, or endangered species, for example. Identify the ideas (write the words on cards) that affect the issue of wetlands, or of endangered species.Then try to organize the cards in a way that makes sense to you.What would you label the categories?

Now think about a topic in which you aren't an expert – perhaps medical insurance, or prison reform? Identify the ideas that affect one of these issues, and then organize the cards and label the categories.

Expertise, by definition, is the development of a rich, dense, and flexible cognitive map. If you have conspicuously more cards, more connections, and more categories for one of your maps than another, your expertise is showing!

Feel free to tape your maps in place and mount them on the wall. It will be good to compare yours with others.

STAKEHOLDER'S SHOES

Project Leader/Supervisor

You manage a small staff with ever increasing tasks, and a shrinking budget. When you put your analytical hat on, you know the most important criterion for projects is cost effectiveness. What do you get for the resources you spend. But when you put your philosophical hat on, you know that building public support is the most important thing for the agency to accomplish in your region, and that could have ramifications far beyond the current fiscal year. You struggle to balance both aspects of good programs, but are most appreciative when your staff provide you both sets of information.

Agency partners (federal and state)

You work within a coalition of federal and state resource management agencies to provide public education programs and information. Before the coalition was organized, everyone had their own program, their own brochures, and tried to get the same limited funds. Now at least you all talk and plan together. New programs are designed in the context of what everyone offers. You care that each program agency at least cares about asking and informing the others in your coalition before the march ahead on their own. You would really like to see joint planning and merging resources to be able to tackle larger projects than anyone would do alone. For the existing programs, you would like to

know how successes can be replicated, adapted by other agencies, and spread throughout the region.

Environmental organizations

You enjoy playing a watchdog role with your local refuge and hatchery. You want to push them a little farther than the basic ecosystem information to building an environmental ethic among the population so everyone will vote to protect endangered species habitat, will dispose of toxics properly, and will manage their own environmental resources across property lines. You care first and foremost about the sustainability of our society on this planet, and you are willing to ruffle feathers and agitate the public to get them to move into the next century. You are committed to changing American lifestyles and assumptions so we might survive.

Rod and Gun Club Members

You and your buddies have been hunting and fishing in this area since you were kids. Now that the FWS manages the land, you are willing to abide by the rules, but certainly want to retain your rights to hunt and fish there.You want to see the Service put your interests first, and you want the public to understand how important the Service is in managing the duck and fish populations so that there is a catchable surplus.

Educators (teachers and youth leaders)

You enjoy bringing your group to the Refuge for a program, but with all the talk about school standards, blueprints for the future, and teacher accountability, you need to make sure that the program will meet the school's curriculum objectives, and that the kids learn something on the field trip that is unique to that area. It costs a lot to get the bus, and you need to make sure this is money well spent. You feel pretty sure that if the kids have fun, they are probably having a worthwhile experience, but it would be nice to be able to show your supervisor that the program will make a difference.

Parents

You like the fact that your kids can get a variety of learning experiences through their school and youth programs and you sometimes supplement that with weekend family outings to nearby places. You care that the facilities are safe, that they kids won't get hurt, that they'll stay warm and dry, and that they'll have fun. You have some extra work to do for your kids to attend a field trip (pack a lunch, pack extra clothes, bake for the sale to raise bus money), so you want your work to be worthwhile.

Community Leaders

As County Supervisors, Mayors, Bank Presidents, and other prestigious individuals in the towns that surround the refuge, you want to see that this big chunk of

land is good for your area. It is good that it brings some tourists dollars (Betty's Country Café gets most of the business), but you also want the refuge staff to participate in local issues, help solve local problems, and be a place where good things happen for the town.

Volunteers and Program Staff

You love working with kids, answering questions, and helping them see how the natural world is put together. You need to learn new information if the program changes, so you care about good training, easy and fun programs to teach. You have a hard time getting lots of equipment and props, so the simpler the program is to operate, the better. You want to work with a program that will make you and the Refuge look good.

Environmental Education in Asia and Beyond

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The Role of Newspapers in Environmental Education

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ABSTRACT

Recently, the economy in China has been developing rapidly. At the same time, the development has caused a crisis on environment .China Government has paid a great attention to the problem. The term environmental education is a term that has a broad sense. In the paper, environmental education only means the popular education on environment.

The topic of the paper is the role of newspaper in environmental education. The paper introduces several newspapers with a relatively big social influence on environmental report in China, and give a clear explanation of efforts that have been made by Chinese environmental newspapers about how to attract readers and the involvement of newspapers in social activities to promote environmental education.

INTRODUCTION

China is the largest developing country in the world, and economic development is of great concern to the whole society. China began its economic restructuring 20 years ago, and the practice of the reform and opening up policy led to an unprecedented economic growth. However, such a growth was realized at a heavy cost of environmental damage, evidenced by severe water and soil losses, devastating floods and droughts, badly short of resources, and widespread pollution. Last year's catastrophic floods, which brought painful suffering to many Chinese people, was an especially good example of environmental problems, having sounded the alarm to China and even the whole world.

The Chinese government has been taking environmental protection seriously. Protecting the environment has become one of the top priorities of the nation, and the important position of environmental protection in social and economic development has been explicitly established. Legal and regulatory measures have also been taken to tighten environmental management. At the same time, the Chinese government also attaches great importance to environmental education, and has been trying to do whatever possible to increase the environmental awareness of the public.

There are a number of channels for environmental education in China, and we will mainly discuss the role of mediums (especially the newspapers) in environmental education.

The mediums play a very important role in disseminating environmental information and in increasing the environmental awareness of the public. Information can reach the public in a short time through the mediums. In China, people, especially those living in remote areas, get access to information mainly through watching TV, listening to the radio, and reading the newspaper. It is believed that the newspapers play a significant role in environmental education.

China has over 1.2 billion people and 5,500 newspapers. The circulation of newspapers is as high as 20 billion copies in China! With such a huge group of readers, you can imagine how big a role the newspapers can play in educating the public.

1. The Chinese newspapers and environmental education

The Chinese mediums had little environmental coverage a few decades ago. This kind of report, spontaneous from the very beginning, gradually became a conscientious action of the mediums. Before mid 1980s, the environmental coverage in Chinese mediums had mainly been focused on the state environmental policies and the government actions concerning the environment. Apart from these, there were only sporadic reports done by journalists concerned about global environmental issues. These journalists had access to foreign publications and were able to introduce the latest environmental news to their Chinese readers.

China's environmental problems began to show themselves with the growth of economy, and the Chinese government was greatly concerned about this. At the same time, the Chinese mediums were also aware of this issue and began to report environmental problems and environmental protection purposely and systematically. Newspapers with a relatively big social influence in environmental report include China Green Times, China Environment News, the Chinese Youth Daily, the Southern Weekends, as well as the Green Weekly and the Environmental Protection Letters of the Science and Technology Daily etc.. Here is a brief introduction of some of them.

(1) China Green Times

China Green Times, formerly called China Forestry News, is published by China National Commission on Afforestation and the National Administration Bureau of Forestry. It currently has five issues each week, and will become a daily newspaper in the year 2000. The newspaper is distributed nationwide and worldwide, with a circulation of nearly 100 thousand copies.

Before 1995, the coverage of China Green Times (called China Forestry News then) was mainly focused on forestry, including forest industry, tree planting, protection of wild animals, as well as issues about ecology, the environment, and the nature. In 1995, the newspaper initiated a weekly publication, the Green Weekly, which focused on ecological and environmental protection. And from then on, the newspaper began to extend its

coverage to various aspects of environmental protection. On January the 1st, 1998, China Forestry News was renamed to China Green Times.

China Green Times is the only national newspaper named as "Green" in ecological and environmental fields in China. The masthead of the newspaper was autographed by Chinese President Jiang Zemin on November the 16th, 1997.

Oriented toward the whole society, the whole world, and the next century, China Green Times has dedicated itself to spreading green information, leading green trends, and building green homes. It will give a timely and objective coverage to the state environmental protection policies, as well as the new achievements, new experiences, and new problems in implementing the sustainable development strategy. At the same time, it will also try to advocate the resource saving production mode and life style, to increase the environmental awareness of the public, to imbue the public with sustainable development concept, to facilitate the implementation of China's Agenda 21, and to contribute to the coordinated development of economic growth and environmental protection as well as the international exchange in related fields.

Currently, China Green Times covers forestry, greening efforts, environmental protection, rational utilization of resources, sustainable development and related fields (including green industry, green science and technology, and green consumption), as well as issues which are of concern to the general public.

(2) China Environment News

This is a national newspaper focused on environmental issues. China Environment News began its publication in January 1984 after inauguration at the Second National Environmental Protection Conference. In 1980s, China Environment News was a very unique newspaper, reporting on a wide range of environmental issues which other newspapers were reluctant to cover. Because of this, China Environment News became popular among the readers in a very short time.

China Environment News has been one of the most convenient channels for the public to get environmental information in China from the very beginning. Today, there are still many environmental journalists from around the country asking for current and back issues of the newspaper.

(3) Green Weekly of the Science and Technology Daily

At the end of 1994, the Science and Technology Daily started a four-page section titled Green Weekly covering both domestic and global environmental issues. The broad readership of Science and Technology Daily enabled an entirely new group of citizens to get access to environmental information. Most materials in this section were solicited and were very popular too. However, the weekly section failed to generate profit for the

newspaper and was at a disadvantageous position in competing with the other more established sections of the newspaper.

(4) Environmental Protection Herald

Based in Chongqing, which is now the fourth municipality directly under the Central Government, the Environmental Protection Herald, or EPH, is jointly published by several environmental agencies in the area, mainly covering environmental issues in southwestern China. Recently, EPH has expanded its coverage to regions beyond the Southwest, and its influence and readership have expanded as a result.

In addition, a large number of local newspapers also began to cover environmental issues. Investigation shows that, there were 17,000 pieces of environmental stories in 70 newspapers in China in 1996, almost two times of the number in 1995, accounting for 1.01% of the 1996 total news coverage. Environmental report has been increasing dramatically in the last three years, but no statistics is available now.

2. Contributions of Chinese newspapers to environmental education

2.1 Characteristics of the report of Chinese newspapers

A newspaper has to have a broad readership in order to contribute to environmental education.

There are two major characteristics in environmental report: one is that the report must be scientific, and must be based on scientific facts; the other is that the report is very professional. By professional we mean that to introduce environmental protection knowledge to the public is a challenging and unavoidable task, because it needs professional knowledge about forest ecosystem. Efforts have been made by Chinese environmental newspapers about how to attract readers. Here I'd like to share with you some of the experiences.

First, pay attention to report planning. A number of carefully planned key reports have been made, causing a great sensation in the society. Take the reports on saving the Yellow River at China Green Times for example. China Green Times published a letter of appeal on saving the Yellow River signed by 151 CAS and CAES Members in the most prominent space on the front page of its first issue, followed by more than 10 issues of discussions in a specially created column titled "Go into Action and Save the Yellow River". The series reports got a very positive feedback from the readers. Other key reports made by China Green Times include "China Yangtze River shelter forest construction", "the Sanbei Shelter Forest, a 20 year story", and "the 10 years anniversary of the issuing of the Wild Life Protection Law" etc.. In addition, China Green Times also organized the publication of a series of special issues, such as "the Special Issue on Rain Forest Protection", "the Special Issue on Preventing Desertification", and "the Special Issue on Forest and Water". These

special issues, each focused on a special topic, were very successful in educating the public. In order to mark the second global day on preventing desertification and drought in 1996, China Green Times (called China Forestry News then) published a special issue on preventing desertification (four pages). 2,000 extra copies were printed for the special issue to distribute free of charge in the streets of Beijing, and were well received by the Beijing residents. Another example is the series in-depth reports made by China Environment News on the important measures taken by the state in order to protect the environment, such as the report on the "Zero Hour Action" in preventing water pollution in the lake Taihu, the report on the campaign to reduce vehicle emissions in Beijing, and the report on the close down of small paper mills and small mines which cause heavy environmental pollution. All of the reports resulted in a sound social effect.

Second, strengthen the monitoring of environmental problems and expose the serious environmental damage events to the public. Such events include the disastrous forest destroying event occurred in Lushan, Henan Province, the denudation case in Ningcheng, Inner Mongolia, the Lishan Protection Zone case in Shanxi Province, and a number of other cases involving the killing of wild animals like Siberia tiger, leopards, grand panda, the Tibetan antelope and takin.

Third, try to be close to the readers. A number of reports were made about environmental issues which could be seen in everyday life. Such topics include white pollution (plastic wrapping bags), one time chopsticks, the sandy weather and air pollution in Beijing, and the clean lakes. Reports of these topics could help to make the public aware that environmental protection is not only of concern to the government, but also of concern to every citizen, and every one should contribute to environmental protection by doing what he or she can do.

Fourth, more efforts have been made to help the public understand science. In order to reach a wider readership, the newspapers have been trying to make their reports more vivid, more interesting, and more attractive. Almost every newspaper who is concerned with environmental issues is paying attention to this respect. Special columns to this regard are numerous, such as "the Animal World", "the Green Nature", and "Man and Nature".

Fifth, graphic arts are employed to make the newspapers more eye catching. China Green Times uses about 200 pictures each month. It also has special graphics reports featuring a whole page of pictures. These pictures, not only eye catching, can help the readers get what they want in a relatively short time.

One thing that newspapers, especially those dealing with environmental education, should abstain from the most is pedantic preaching. After a day's work, who are willing to read the preaches from the newspapers? Instead of preaching, the newspapers should tell lively and interesting stories to their readers. A newspaper can not be said as successful without a large number of readers who are willing to read it.

2.2 The involvement of newspapers in social activities

By involvement we mean not only the covering of social activities, but also the organizing and sponsoring of such activities. All of the Chinese newspapers concerning environmental issues have a proven record in this respect. A series of social activities concerning environmental protection with a newspaper involvement have been successfully organized, such as "Chinese Environmental Campaign---Marching Toward the Next Century", "Protect the Green---A Cross Century Action", "Let the Birds Back to the Sky", "Greening the Vast Desert", and "Conserving 100 Famous Trees of China" etc..

A. The Little Reporters Green Covering Tour. Children are the future of the world. To protect the Earth, the common home of all human beings, we must begin from educating our children, to let them have a clear concept of environmental protection and a strong sense of responsibility. Bearing this in mind, the Chinese Association on Wild Life Protection and China Green Times (called China Forestry News then) jointly sponsored an activity titled "Go To the Animal's Home---the 1996 Little Reporters Green Covering Tour" in early August, 1996. The activity was very successful. The little reporters wrote many stories after the activity, and China Green Times created a special column for them. The little reporters benefited a lot from this activity, and they also helped to increase the environmental awareness of the public through their writings.

B. Let the Birds Back to the Sky. This activity was jointly sponsored by China Green Times, the Chinese Association on Wild Life Protection, and Nature's Friend-an environmental protection NGO, between March and April of 1996. They held this activity because wild birds were disappearing due to caged raising in big cities like Beijing. This activity was coincided with the 15th Loving the Birds Week of China. Based on an investigation in 5 birds markets in Beijing, China Green Times published a special issue for the event, using 4 whole pages. The special issue, which talked about the damage of caged raising to wild birds, was printed 30 thousand extra copies to be distributed by volunteers from four universities to passersby in down town Beijing, university campuses, residential areas, and various birds markets. After that, China Green Times, in cooperation with the Chinese Association on Wild Life Protection, held a ceremony at the Beijing Endangered Animals Saving Center to let the caged wild birds go back to nature. This action got a very enthusiastic response from environmentalists. Almost all Beijing based news mediums covered the event, which was believed very helpful in spreading the concept of anti-caged raising of wild birds.

C. Let the Wild Geese Fulfill Their Wish. There was a wild geese "spouse" flying to the Zizhu Park in Beijing to egg for four consecutive years. But their eggs, shortly before being hatched out, were always stolen by the covetous people each year. China Green Times Learned that the "spouse" flew to the park for the fifth time in mid March, 1997, and covered this news on March 29. It was the only newspaper carrying this news. In order to protect the "spouse" during hatching, China Green Times, in cooperation with an environmental protection group from Beijing Forestry University, mobilized nearly 200

volunteer college students to camp in the park for 27 days round the clock to safeguard the "spouse". Their efforts paid off. The "spouse" produced six eggs, from which three baby wild geese were hatched. Mediums (including TV, radios, newspapers and magazines) both at home and abroad covered the event for 60 or more times during that month, and for many times, there were special columns or even special pages contributed to the event. The students sincere action and the mediums extensive covering aroused the enthusiasm of Beijing residents in wild animals. According to statistics, there were about 300 thousand residents came to the park to watch the geese hatching in a month time. "Let the Wild Geese Fulfill Their Wish" became a well known event in Beijing during April and May of 1997. This activity was believed to be a great help for educating the public to protect the wild animals and love the nature.

D. Chinese Environmental Campaign---Marching Toward the Next Century. A survey conducted by the China Environmental Protection Foundation in 1995 found that sixty percent of the 4,000 people interviewed thought that China was rich in natural resources and there was no need to worry about them. In addition, over eighty percent admitted that they knew little about environmental problems. The result shows that there is a sharp contrast between the severeness of the country's environmental problems and the environmental awareness of the public.

The Foundation recommended a strategy of increasing public awareness through the news mediums. More importantly, it was hoped that these efforts would attract the attention of government officials and policy makers. In 1993 ,the Environmental Protection and Natural Resources Conservation Committee (EPNRC) under the National People's Congress launched an activity titled "Chinese Environmental Campaign---Marching Toward the Next Century", which was aimed at raising the environmental awareness of the public. Each year, a single theme is chosen as a focus topic for the campaign. EPNRC then convenes and develops media activities on the topic, and at the same time, 27 provinces, municipalities and autonomous regions carry out their own activities on the same topic at the local level. Top officials and over a hundred journalists will travel to the regions where the activities are held, and 800 million people will learn about these activities via newspapers and television programs.

The Chinese newspapers have done a lot in introducing green civilization, guiding green economy and promoting green action. They have become an important source of green information in China.

CONCLUSION

The attitude of the public toward the nature has changed fundamentally in recent years due to the introduction of environmental education. Environmental awareness has become an important component of human civilization and an important measurement of being a modern man.

According to the World Environmental Development Commission, legal, administrative, and economic measures can not solve all problems, one of the major reasons why we can't overcome the further degradation of the environment is that most people around the world have not yet formed a new ethic concept about the environment which is needed in modern industrial and technological societies, and the next few decades will be the key period to form such kind of ethics. The commission further emphasizes that, the core of the new sustainable development ethics should be the respect to nature, we should think ourselves as really a part of the nature, should forget about our victory over nature, and should ensure an equal opportunity between contemporaries and between us and our future generations. The ethic has two important themes: "There is only one earth" and "Tomorrow is as important as today". The new ethic will try to adjust the relations between human beings and nature as well as the relations between human beings themselves from the concepts deep in our heart, and we can only make this possible mainly through environmental education.

Currently, the environmental awareness of Chinese people has improved a lot thanks to the efforts of Chinese mediums in promoting environmental education.

Back in a decade a ago, when asked what was environmental protection, most Chinese people would say that environmental protection was environmental sanitation and to take part in environmental protection was to take part in the general sanitation movement. Their concept about environmental protection was very naive. Today, many have realized that to protect the environment is to protect ourselves, and environmental damage will lower our living standards, or even bring us unexpected disasters. Therefore, they begin to care about environmental problems on a self promoted basis. Many residents in Beijing, Shanghai and other big cities are used to paying attention to air quality reports every day, wishing that the sky will always be blue. At the same time, they know how to contribute to a better environment by changing their own life styles. For example, many people now are conscious of avoiding water waste, classifying their rubbish, and using as less plastic bags as possible to reduce the so called white pollution. They are also enthusiastic about volunteer environmental protection efforts. These changes are really encouraging.

However, we must note that, China is a big developing country with more than 1.3 billion people, and the environmental consciousness of some Chinese still needs to be improved. Some regions are still poverty stricken, they need to develop their economy in order to leave poverty, and unchecked economic development will unavoidably lead to environmental damage. Therefore, in China, let the public know about the importance of environmental protection is still a long way to go, and let the public accept the concept of coordinated development of economic growth and environmental protection is still a long way to go too.

In short, we still have a lot of things to do in terms of environmental education in China, and we are far from feeling relieved.

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Environmental Education for Sustainable Human Development: A Case Study from Nepal

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ABSTRACT

Nepal is a land of ecological contrasts. This paper discusses the evolution of environmental education for sustainable human development in Nepal. It critically examines the need for effective participatory environmental education to bring the local communities and different stakeholders in the mainstream of sustainable development. It also discusses a wide range of strategies adopted by government and non-governmental conservation and environmental organisations. The paper highlights a successful cases that have demonstrated environmental education as a means for protected area management, bio-diversity conservation and sustainable development. It concludes with an emphasis on designing an integrated, holistic and participatory environmental education programmes linking indigenous knowledge and skills, and addressing the basic needs of poor communities to achieve the goal of sustainable human development.

INTRODUCTION

Nepal is situated between two large and most populous countries India and China. It has a population of over 21 million people living in an area of 47,181 sq. km. Forest resource is one of the most important natural resources of the country. It covers 38 percent of land area (NSAC 1998). But the forest cover has been drastically reduced on account of growing population growth and a tremendous pressure to meet the fuel wood, timber and fodder needs of the poor communities. Forest depletion rate in Nepal is 2.1 percent and rural livelihoods continue to increasingly rely on the natural resources for sustaining their living (HMG/UNDP 1996).

Environmental education has recently becoming popular in Nepal but it has been practised for many years in traditional societies where people have been living close to the natural world. The tremendous pressure on the natural environment in the hill areas due to rapid population growth and overuse of resources and in the absence of strict – pollution law and industrial regulations in the urban areas have threatened the livelihoods of people.

Environmental problems have become severe and therefore, urgent actions are required to mitigate these problems.

This paper is prepared based on action research carried over the past decade in environmental education for protected area management and sustainable development in Nepal. A literature review on the participatory model of environmental education in developing countries, its trend and progress that have made since the past decade was carried out.

Sustainable Human Development

The World Bank study of 1990 classifies Nepal as a poor nation with 70 percent of the population below poverty line (HMG/UNDP 1986). The basic cause of poverty is excessive population concentrated on an insufficient economic base. The main cause can be linked to population growth, increased poverty, a weakened capacity base of natural resources and weaknesses in decision making over the use of resources.

The Brundtland Commission defined sustainable development as "development that meets the needs of resent without compromising the ability of future generations to meet their own needs" (WCED 1987). It is imperative that development brings back together into integrated concept by bringing sustainable development and human development together through "Sustainable Human Development". This proposition has been strongly supported by multilateral agencies such as the United Nations Development Programme (UNDP). More simply, as the UNDP (1993:3 cited in NSAC 1998: 30) notes:

Human development is the development *of* the people *for* the people *by* the people. Development *of* the people means investing in human capabilities, whether in education or health or skills, so that they can work productively and creatively. Development *for* the people means ensuring that the economic growth they generate is distributed widely and fairly... Development *by* the people (means) ... giving everyone a chance to participate.

The notion of social justice is well emphasized by environmental educators. This is relevant in developing countries where the poverty and environmental nexus is strong. Commoner (1973) pointed out that we will not learn to treat the world of nature as it needs to be treated until we learn to treat our human beings, as they deserve to be treated in the ancient coin of social justice. In considering this powerful proposition, environmental education should embrace the human dimensions so that nature conservation can take place.

Non-formal environmental education in Nepal is driven by cultural and social beliefs in many indigenous societies in developing countries like Nepal. For instance, religious beliefs such as Hinduism and Buddhism embrace environmental conservation values and they have been practised for centuries. These practices have been rooted

through religious beliefs. Gurung (1992, 1993) found that in many parts of developing countries, the local communities do not know about environmental education but they have been practising for many years through their cultural values, social norms and beliefs. This can be incorporated in environmental education strategies.

Environmental Problems in Nepal

"An environmental problem is a resource and life damaging situation which is not universally recognised or is difficult to improve" (Trudgill 1990: 42 cited in Gurung 1993). The growing concerns on environmental issues in the urban and rural areas have attracted the government and non-governmental organisations to tackle the issues. Industrial pollution and vehicles emissions have created tremendous health problems and health related diseases in urban areas like Kathmandu. (Panday 1993; Joshi 1997 cited in NSAC 1998) reported that Kathmandu valley is experiencing a strange meteorological process nowadays, which is known as *temperature inversion*, that is aggravating the air pollution problems of this Himalayan metropolis. The Bagmati, the sacred river, which flows through the middle of the Kathmandu valley, was clean until the last decade. However, the river has been highly polluted due to the sewerage disposal and industrial waste leading towards devastating environmental problems. The river is dying. It is beyond the carrying capacity of natural process that can clean through dilution process. The notion of 'dilution is solution to pollution' has become irrelevant due to exceeding of carrying capacity of the river.

Nepal's mountain regions especially through trekking tourism and mountaineering activities attracted global communities after the successful ascent of Mt. Everest by Tenzing Norge Sherpa and Sir Edmund Hillary in 1953. After 1960, trekking and expedition in the Himalayas became popular destination for international visitors. The number of trekkers has been increasing and the figure has reached over 91,000 annually. Tourism has definitely brought some economic benefits but the environmental and social costs are also severe.

After 1980, the garbage pollution and deforestation has caught the international media where the Himalayas have been sick from the human interventions. Sherpa et.al (1986) carried out the feasibility study for tourism management and environmental conservation in the Annapurna region, the most popular tourist destination attracting over 60 percent of trekkers, in response to the severe environmental crises. The Everest region has been reported as the world's highest dumping site. The use of toilet papers along the trekking route is another environmental problem. The local people in the Khumbu region of Nepal called the toilet papers as 'white men's prayers flags'. Other trekking destinations such as Annapurna and Langtang regions have also faced the rubbish pollution and deforestation problems. For instance, Gurung and Arthur (1995) revealed that mineral waters bottles have become a threat to the entire Annapurna region. Even if 10

percent of trekkers use mineral water bottles, that is 99,000 discarded each year and if they were stacked up, they would reach to over three times the height of Annapurna I (8091 meter). There are many other examples where environmental problems have been deep rooted from the urban to the mountain regions. To tackle these deep- rooted problems a common effort is essential through building partnerships of all stakeholders.

An Integrative and Participatory Model for Environmental Education

Until recently, in developing countries like Nepal environmental education material and models were often imported from the developed countries. These materials and models were less appropriate due to the needs and problems in developing countries are different. In response to this, (Gurung 1993, Gurung, et al 1995) developed an integrative and participatory model for environmental education, which was reviewed by a panel of international experts in environmental education. The model calls for a strong participation of main actors in promotion of conservation of natural resources and sustainable development for sustainability of our society through synergic efforts. The model has been widely tested in Nepal and found practical in developing community-based environmental education that will lead sustainable actions in promoting sustainable development and conservation values (see model in Annex i). The model emphasises to bring stakeholders or target groups in the mainstream of sustainable development with practical actions in resolving environmental issues.

Partners in Action: From Awareness to Actions

To solve the growing environmental problems, a wide range of institutions have been involved in environmental education. Environmental education is broad and multi-disciplinary subject where wide ranges of activities need to be carried out through optimum people's participation. Following are the successful cases conducted by government and non-governmental organisations. Many institutions and individuals are engaged in various programmes, but the following cases have been found some of the best examples that brought changes in the attitudes of people and carried out sustainable actions.

Annapurna Conservation Area Project

Nepal's first and largest protected area, the Annapurna Conservation Area Project (ACAP), established in 1986 by the King Mahendra Trust for Nature Conservation has been implementing an integrated conservation and development programme. ACAP's activities are focused on tourism management, nature conservation and community

development programmes. Conservation Education and Extension Programme (CEEP)[1] is regarded as the vehicle for motivating local communities towards protected area management. The main aim of the CEEP is to inform and educate local communities, teachers and students, and international trekkers on conservation problems prevalent in their areas and to promote the ACAP philosophy and its importance for better management of a depleting resource base. The CEEP is at the heart of the entire ACAP in order to sustain the community-based integrated conservation and development programmes. Finding technical solution is easier than motivating people in conservation efforts.

Conservation education has played a vital role in educating people and getting conservation message through. Therefore, CEEP is the paradigm through which all ACAP activities attain relevance (Gurung, et.al., 1995, KMTNC 1998). The KMTNC has promoted in conservation education in its projects promoting from wildlife conservation to tourism management. The major education and extension strategies and activities include door to door visit, involvement of local leaders as resource persons, slide talks, exposure visit, audio-visual and other capacity building activities. Indigenous knowledge and skills are widely adopted in making environmental education more effective and efficient.

World Wildlife Fund

Environmental education has been highly promoted by international NGOs working in the field of environmental management, nature conservation and protected area management. The World Wildlife Fund (WWF) in Nepal is actively working in collaboration with the Department of National Parks and Wildlife Conservation (DNPWC), the KMTNC and with many educational institutions like schools and local youth clubs. The WWF has supported the DNPWC's capacity building for conservation education in protected area management such as National Parks and Wildlife Reserves, and conservation areas. Until recently, the WWF Nepal Programme has supported schools in promotion of environmental education through formation of Eco-clubs in urban and rural schools.

With the support and initiation of WWF fifty- five Eco-clubs have been formed (Lama 1999). Out of this, twenty Eco-clubs have been formed in the schools of Kathmandu valley, three Eco-clubs in Sagarmatha, two in Dolpa and thirty in around Royal Bardiya National Park. The WWF has also promoted conservation education through Eco-clubs in collaboration with the Central Zoo for conservation education targeting young urban school children. The idea of promoting Eco-clubs is to institutionally sustain students' environmental activities at their schools (KMTNC/Central Zoo 1998). WWF and the KMTNC have published several awareness generation materials such as Save the Tiger, Eco- club manuals, posters, green gifts and newsletters. Such programmes have

[1] In the Annapurna Conservation Area Project the term conservation education and environmental education have been used simultanesouly. The area faces severe conservation problems and problems are addressed through conservation education and extension activities.

been productive in generating conservation awareness and conservation of Nepal's depleting biodiversity and natural resources.

The World Conservation Union

The World Conservation Union (IUCN) in Nepal has joined its hands with the government and NGOs in developing environmental education in formal education through its project called National Conservation Strategy Project. IUCN is the leading institution involved in formal and non-formal environmental education research. Pande and Karki (1998) have conducted extensive research under the National Conservation Strategy Implementation Project's Environmental Education for Primary School Programme.The study has revealed the effectiveness of teacher' training, resource materials, impacts of environmental education on community and schools and further suggestions for effective environmental education. There is a growing concerns among the communities and students about the environment and need for more effective resources target at different participating groups.Since the past decade, the IUCN has supported the government's efforts in formulation of macro level policies in environmental conservation.

Kathmandu Environmental Education Project

Every year, over 4,50,000 tourists visit Nepal. Approximately, 91,000 tourists go trekking in the hills and mountain regions. Most of them are not well informed of Nepalese cultural values, or of the sensitivity of the natural environment. They are not aware that their actions may adversely affect the country and its people. The Kathmandu Environmental Education Project (KEEP), an NGO, was established to help trekkers learn how to minimise the negative effects that their ignorance may occur. It also facilitates them how to "trek gently" and to support positive efforts at cultural and environmental conservation.

KEEP has conducted several courses such as lodge owners' training, first aid courses, village and trail clean up campaigns, English language, establishment of information centres, Eco-tourism workshops, slides shows, environmental resource centres and newsletters. The role of KEEP is vital not just for educating the visitors but also for promoting Nepal's growing tourism industry.

Tourism is a growing clean industry in Nepal representing 3.8 percent of the GDP and foreign exchange earning of US$ 117 million in 1996 (Sherpa 1998). This has contributed in promoting Nepal's images in overseas with high volume income and less environmental impact approach supporting the livelihoods of rural communities and boosting local economy. For instance, many Nepali lodge owners in the mountains are having the opportunities to admit their children in the cities for better education.

Sustainable Community Development Programme

The Sustainable Community Development Programme (SCDP), also known as the Nepal Capacity 21 programme has been formulated in line with Agenda 21 adopted by the 1992 Earth Summit at Rio de Jenerio. SCDP, established to support the efforts of His majesty's Government of Nepal in promoting sustainable development in the country, is a joint undertaking of the National Planning Commission and United Nations Development Programme (UNDP). Launched in the beginning of 1997, the Programme covers three districts of the country and aims to develop capacities of non-governmental organisations and Community-based Orgnisations (CBOs) engaged in sustainable development of the country. Through building the capacity of local institutions to implement and monitor development efforts, SCDP has adopted a 'social capital formation' approach to the mobilisation of local communities and their stakeholders to implement the activities at grassroots level. It involves organisational development, capital formation and skills enhancement amongst men and women. At least 80 percent of households are mobilised at the settlement level to form CBOs. The Programme has focused on environmental management, economic development and social development programmes combined with gender empowerment and the enhancement of sustainable livelihoods of disadvantaged indigenous communities. SCDP also embrace the Chapter 36 of Agenda 21, which is focused on environmental education, training and public awareness for sustainable development in the 21st century.

SCDP has used environmental education as a means for social mobilisation for conservation of natural resources. Some of the activities include audio-visual show on environmental issues, cultural programmes, study tours, awareness programmes and publications to share conservation messages. Although environmental education itself is not the end but a means for attitudinal change and awareness generation so that sustainable actions can be carried out. These activities have strengthened the government's efforts and such partnerships should be fostered to solve the common problems by putting the local people's needs at the centre as well. SCDP's integration of social development, economic development and environmental conservation is leading towards a better path for sustainable human development.

Institutionalising Environmental Education

Conservationists and environmentalists in the past had difficulty in including conservation and environmental education in the formal education system. The government owned schools had no flexibility in introducing environmental education courses. For example, when the ACAP introduced conservation education in schools in 1986, the concerned schools used an extra hour for conservation education classes. Not all the teachers and students had taken interest in it because it was not mandatory in the curriculum. However, there has been a dramatic shift toward development of environmental education since then. 1992 stands as a landmark year in the development of

environmental education in Nepal (NPC/IUCN 1998). Separate courses on environmental education were formally introduced from grades one to ten. The role of NGOs and INGOs have now been focused more on extra curricula and provide quality environmental education through the existing education system. Education to teachers has been encouraged so that they could adequately teach the complexity of environmental education. His Majesty's Government of Nepal also set up new Ministry of Population and Environment (MOPE) in 1995 which is considered as a milestone in promoting environmental policies and education in the country. The MOPE has a lead role in environmental conservation activities. It formulates policies related with environment, population, and capacity building in environmental management and organises various awareness generation programmes including seminars and workshops. It is also supporting NGOs in conducting various environmental awareness activities.

Towards Sustainable Future

Environmental education is a powerful tool in mobilising and empowering local communities for sustainable human development. Poverty alleviation is the main goal of the government. The livelihoods of the poor communities are heavily dependent on the natural resource-base and are found responsible in depleting resources. A win –win strategy is vital where communities can benefit in involving environmental education activities. To support the poverty alleviation and conserve natural resources, the government of Nepal has taken several initiatives. Putting local communities first and enhancing their capabilities for choosing and mobilising their own resources for improving their lives is the key for sustainable future. Environmental education can serve as to means in bringing local communities in the mainstream of sustainable human development process.

Gurung (1993) concluded that in developing countries environmental education at community level should be supported by incentives so that it becomes more practical and can bring changes in the lives of people. In the absence of appropriate incentives local communities will not be motivated and cooperative in solving environmental problems. Without the active participation of communities environmental education efforts will become less fruitful and will not contribute towards a sustainable common future.

Environmental education is used as a strategy for sustainable human development. For example, the Annapurna Conservation Area Project in the mountain regions and the Sustainable Community Development Programme in the Terai region have empowered women through non-formal environmental education. The women have got the opportunities to become literate and learn more environmental issues linking into their daily lives. They learn from basic literacy classes to identifying environmental problems and ways for solving these problems. For instance, use of alternative energy source, health and sanitation, and income generation activities. These activities support

environmental conservation programmes and enhance to improve their socio-economic conditions.

Eco-schools were set up with the collaboration of communities, teachers and students and Eco-friendly activities have been introduced. For instance, the establishment of multi-purpose forest nurseries, clean up campaigns and plantations of seedlings in barren lands and degraded watersheds have a great influence on local communities. The schools have two direct benefits. First, the students have access to learn first- hand environmental problems such as nursery management and plantations. The teachers use the multipurpose nursery as an environmental laboratory and practical aspect of environmental education is taught. Second, the schools can benefit, in the long run, from the selling of timbers and grasses, which they have planted around their schools. Such visible benefits have encouraged the communities to participate environmental education activities.

Ensuring Sustainability

More efforts by various agencies have found promoting environmental education for sustainable development. However, there is still a need for a strong coordination and cooperation among the environmental educators to bring more synergic efforts. There is no coordinating body responsible for bringing them in a common plate-form and share their experiences. Individual efforts are not enough. Strong linkages and coordination can constitute quality education programmes, share essential information and minimise unnecessary costs.

The Ministry of Population and Environment can play the role of catalyst in bringing the stakeholders together and also can prevent environmental problems through formulating and implementing environmental policies. Furthermore, the National Planning Commission can play an important role in promoting environmental education. The formulation of and implementation of national conservation policies such as the National Conservation Strategy of Nepal and National Environmental Action Plan need to be fully implemented. Coordination between the ministries and departments need to be improved to bring the NGOs and INGOs in the mainstream of environmental education and sustainable development.

Linkages with indigenous people's knowledge and skills are also important to safeguard the environmental management issues. In remote villages, the people have different ways of protecting different environment. Their cultural values, social norms and their wisdom and skills should be part of strategies in disseminating environmental messages. This will also encourage the poor communities to take leading roles in environmental conservation and sustainable development. Integrating their needs in educational strategies can be more effective. Educators can learn a lot from the indigenous people.

CONCLUSIONS

The need for environmental education for sustainable human development is well recognised recently by the government and non-governmental organisations in Nepal. Most of these organisations have incorporated environmental education into their programmes as a means for achieving their environmental conservation goals. People are becoming more aware of the environmental concerns. But they are tied up with the vicious circle of poverty where their livelihood is dependent on the natural resources. A wise use and management of resources are integral part of sustainable development. And therefore, people should be empowered for the management of resources as they are the custodians of their environment. The environmental education for sustainable human development should be people-centred to turn human development- of the people, for the people and by the people in to reality. Poor people have little choice for alternative ways of meeting their basic needs. Under these circumstances, environmental education activities should be focused across the country with appropriate incentives.

Environmental education in Nepal has started to focus less on the theories and concepts but more on issues that affect the daily lives of people with appropriate incentives. Once people see the benefits from environmental education, they will participate and involve for common actions. For this, an integrative and participatory model for environmental education is essential to make education more practical and people-centred strategies. It is a high time to divorce from traditional system of classroom-based environmental education to holistic and participatory environmental education. The traditional values, indigenous knowledge and skills are also equally important to link with educational strategies. This can bring people of all walks of life together in making the Earth for a better place to live and improving the quality of lives of the people through sustainable human development initiatives.

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Environmental Education as A Vehicle to Promote Environmental Literacy in Low Literate Communities of the World

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ABSTRACT

More than half of the world population lives in developing countries and these countries have [a number of] environmental problems in common related to such factors as their ecological conditions, their lack of economic vitality, and the poverty of their people. Although these factors also exist in industrial countries, their magnitude and impacts are more severe in the third world countries (The Pakistan National Conservation Strategy 1992). Environmental degradation is taking place at a faster rate in these areas simply due to lack of empowerment and citizens perception of their locus of control.

Nearly 800 million people are non- or low literate, mainly due to socioeconomic reasons rather than because of low intelligence. Most of these people have low [or no] literacy skills, have average IQs and function well by compensating in other ways for their lack of literacy skills (Doak et.al. 1996). Access to educational institutions where formal literacy skills can be acquired is very limited. Yet, this vast majority manages to communicate with each other and conduct their daily business in many spheres of life. Quite often, the written word is not used. The communication is usually oral and contracts are made with verbal agreements, without paper (Jean-Paul Hauteucoeur 1994). Providing learners with more opportunities to deal and act upon local environmental concerns can strengthen learning gained by 'real life' experiences.

As recognized by Agenda 21 (1993), " Education is critical for promoting sustainable development and improving the capacity of people to address environmental and development issues. . . To be effective, environment and development education should deal with the dynamics of the physical, biological, social, economic and spiritual environment (p.293)". Literacy education, be it formal or environmental, thus becomes a very important part of this holistic view.

Environmental education can play an important role in promoting environmental literacy as its goals include more than acquiring information. It is driven by a mission: to produce a concerned citizenry that is intellectually and psychologically able to understand

environmental concerns of its community and is prepared to make positive choices that could reduce impacts of our life styles on the natural environment.

This paper explores the relationships between levels of environmental literacy and formal literacy skills and highlights the need for developing appropriate environmental education programs in low literate communities of the world.

INTRODUCTION

Agenda 21, adopted at the Earth Summit in Brazil in 1992 by nations representing over 98% of the earth population, declares that "the effect of human impact upon the earth have been accelerating at a rate unforeseen even a handful of decades ago. Where once nature seemed forever the dominant force on earth, evidence is rapidly accumulating that human influence over nature has reached a point where natural forces may soon be overwhelmed" (p.1). This is also evident from the statements made in The Pakistan National Conservation Strategy (1992) which states that " Humanity's impact on the earth and its resources has increased at an unprecedented rate with every decade in the last two centuries, and with every year in the most recent decades" (p. xv). According to a Worldwatch Institute Report on Progress towards a Sustainable Society (1997) "In these recent decades, the earth's biological riches have been rapidly and irreversibly diminished. Huge areas of old-growth forests have been degraded or cleared – in temperate as well as tropical regions – eliminating thousands of species of plants and animals. Biologically rich wetlands and coral reefs are suffering similar fates" (p. 3).

Time after time, creatures thought useless or harmful have been found to play crucial roles in natural systems. This situation has been more visible in the recent decades. Predators driven to extinction no longer keep the population of pests in check; earthworms or termites killed by pesticides no longer aerate soils; mangroves cut for firewood no longer protect coastlines from the evasive force of the sea (Ryan 1992). More than half of the world population lives in developing countries and these countries have [a number of] environmental problems in common, related to such factors as their ecological conditions, their lack of economic vitality, and the poverty of their peoples. Although these factors also exist in developed countries, their magnitude and impacts are more severe in the third world (The Pakistan National Conservation Strategy 1992). This observation is based on the socio-economic status of communities and lack of opportunities and resources to improve the quality of their life. Despite a surge in economic growth in developing countries, an estimated 1.3 billion people are so poor that they cannot meet their basic needs for food and shelter. Among other challenges, these less-privileged communities also face environmental degradation as a result of detrimental practices of managing their natural resources. (State of the World 1997).

Forests are being widely devastated in all parts of the world. According to a report published by Worldwatch Institute (Vital signs 1996), most of the loss has occurred since 1950. Beginning at mid-century, much of the disappearance of the world's forest cover was

concentrated in the tropical and subtropical regions as a result of the clearance of forestland for farming, the logging of tropical hardwoods, and firewood gathering. But now heavy damage is occurring in the northern temperate zone as well. Canada may now be losing a million hectare of forest cover annually. Even worse destruction is occurring in Siberia, which may now be losing 4 million hectares a year.

The changing environment directly effects the communities that live within these regions of extremities. Most of these communities are also challenged by the low rates of formal literacy skills and adverse living conditions. Throughout the world, almost 800 million people are non- or low literate mainly due to socio-economic reasons. Yet, according to Jean-Paul Hauteucoeur (1994), this vast majority manages to communicate with each other and conduct their daily business in many spheres of life. Quite often, the written word is not used. The communication is usually oral and contracts are made with verbal agreements, without paper. Most of these people have low literacy skills, have average IQs and function well by compensating in other ways for their lack of literacy skills (Doak et.al 1996). Given this scenario, it is very important for environmental educators and program planners to understand and design relevant education and communication strategies for these communities in order to enhance their involvement in decision making processes.

CHALLENGES FOR ENVIRONMENT EDUCATION

Formal literacy and environmental decision making

A major goal of environmental education focuses on enhancing the ability of learners to respond to environmental issues in a critical manner so as to make decisions that will not only address the immediate concerns but also ensure sustainability of action taken in the long run. This is possible where learners have the accessibility to formal education. However, when the opportunities for low literate communities are limited in this respect, how can environmental literacy be promoted in the absence of formal literacy skills? This is a major challenge for environmental educators in all parts of the world.

Formal literacy is usually evaluated as an individual skill, corresponding to external criteria, generally based on school norms. In many countries, major focus on this skill has given rise to universal basic education programs, which are usually unrelated to the socio-cultural contexts in which they operate (Fingeret and Jurmo 1989). According to Courts (1991), the word literacy suggests a state of being and a set of capabilities through which the literate individual is able to utilize the interior world of self to act upon and interact with exterior structure of the world around her/him in order to make sense of self and other. This model of accountability to others and ourselves around us can help enhance environmental decision making skills if learners are able to understand the interrelationships in the natural world and make informed choices about their environmental concerns.

Communities with low formal literacy skills constitute a visible part of any society, be it industrial or agrarian. In order to provide such individuals and communities with improved skills of decision making and critical thinking leading to better problem solving strategies, environmental educators need to explore existing levels of environmental awareness and appropriate channels of communications employed by these communities. This will enable planners and policy makers to develop programs and strategies that are relevant and 'real' to concerns of low literate citizens of the world.

Environmental education and environmental literacy

In exploring the international arena for concepts underlying environmental education, it is evident that creation of an environmentally literate citizenry is considered to be a major goal of environmental education. This view is based on declarations of some of the key international conventions in the history of environmental movement. For example, the definition of environmental education developed at a workshop sponsored by UNESCO/UNEP in Belgrade, Yugoslavia in October 1975 claims that:

> "Environmental education is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, commitments, and skills to work individually and collectively toward solutions of current problems and the prevention of new ones." (Belgrade Charter, 1975)

Further expanded in another intergovernmental conference held at Tbilisi, Georgia, USSR in 1977, the aim of environmental education was recommended as:

> ". . . to create individuals who acknowledge the fact that the natural environment and man made environment are profoundly interdependent [and to]
> . . . prepare the individual for life through an understanding of the major problems of the contemporary world, and the provision of skills and attributes needed to play a productive role towards improving life and protecting the environment with due regard given to ethical values." (UNESCO/UNEP, 1977).

Nearly two decades later, a think piece entitled *Educating for a viable Future: A multi disciplinary vision for concerted action* was developed during an international conference on Environment and Society: education and public awareness for sustainability hosted by UNESCO in Thessaloniki, Greece in 1997. A draft declaration based on the work of the United Nations Commission for the Sustainable Development and under the continuing activities of Agenda 21 (Orellana 1998) suggests that:

" The concept of sustainability encompasses not only environmental issues but also issues of poverty, population, health, food security, democracy, human rights and peace. In

the final analysis, sustainability is an ethical and moral imperative which implies respect for cultural diversity and traditional knowledge (page 2)" (Thessaloniki Declaration 1997).

As is evident from these globally established views and accepted by environmental educators, environmental literacy is a major prerequisite for making better environmental decisions by any society of the world. If we accept the premise made by the regional, national and global forums on environmental education that all citizens need to have some level of environmental literacy in order to demonstrate responsible environmental behavior and better decision making skills, then we need to explore current levels of environmental literacy in different sectors of society and identify strategies employed for effective communication of environmental messages. Exploring environmental literacy levels in low literate societies will help policy makers and planners develop effective strategies and programs and will also strengthen outreach to low literate societies in order to highlight local environmental issues and concerns and encourage them to be more involved in decision making, program planning and policy development processes.

Environmental literacy defined. . and redefined

When the field of environmental education is explored for a definition of environmental literacy, it becomes clear that according to the leaders, it "is essentially the capacity to perceive and interpret the relative health of ecosystems and take appropriate action to maintain, restore, or improve the health of those systems (Disinger and Roth 1992, Roth 1992) offers that environmental literacy "should be defined . . . in terms of observable behavior. That is, people should be able to demonstrate in some observable form what they have learned - their knowledge of key concepts, skills acquired, disposition towards issues, and the like" (p.2).

A large number of the practitioners in the field of environmental education define environmental literacy in cognitive terms. Disinger and Roth (1992) are of the opinion that these [formal] educators believe that knowledge is a pre-condition of thoughtful behavior and action. Disinger and Roth (1992) also declare that educational systems usually limit their operational objectives to the attainment of knowledge and skills related to their effective and efficient acquisition; these education systems do not actively promote the pro-active development of "responsible environmental behavior" as described by Hungerford (1987). Observations of individual and societal environmental behavior also belies the assumption that behavioral change follows directly from development of necessary knowledge and skills (Iozzi 1989). Drawing from this school of thought, it can be safely assumed that positive attitudes leading to responsible environmental behavior of citizens towards the natural environment are more than the ability to be scientifically knowledgeable about the environmental issues.

If sustainable living is also an indication of being environmentally literate, then we need to acknowledge the environmentally friendly life styles of indigenous cultures. As Orr (1994) declares, "It is a matter of no small consequence that the communities who have

lived sustaianably on the planet for any length of time could not read, or like the Amish do not make a fetish of reading" (p 8).

Environmental literacy in low literate communities

A major challenge for environmental educators thus is, how can environmental literacy be promoted in low literate societies where scientific knowledge of key concepts and formal literacy skills are not well developed keeping the academic definition of environmental literacy in mind. An example here is global climate change - a complex issue that is linked to many interconnected environmental phenomena. Can a learner with low literacy skills even begin to understand the complex chemical reactions? A bigger question is, does he or she need to? Or will it be enough to highlight simpler issues such as our personal choices in daily life that could be critical to global climate change.

Roth (1992) has proposed three levels of environmental literacy in order to identify and assess observable behavior of citizens. These include:

1. *Nominal* indicating the ability to recognize many of the basic terms used in communicating about the environment and to provide rough, if unsophisticated, working definition of their meaning. Low literate communities usually have a developed understanding of the environmental issues around them and can identify them in vernacular. However, they may not be able to articulate them in scientific terms;
2. *Functional* indicating a broader knowledge and understanding of the nature and interaction between human social systems and other natural systems. The daily practices and decisions are usually based on understanding of environmental issues and their relevancy to local life styles of low literate communities; and
3. *Operational* indicating progress beyond functional literacy in both the breadth and depth of understanding and skills. Recycling, reusing and reducing are common in low literate communities. These practices are not only driven by environmental concerns but also by economic decisions making them more tuned in with sustainable living standards.

CONCLUSION

As recognized by Agenda 21 (1993), "Education is critical for promoting sustainable development and improving the capacity of people to address environmental and development issues . . . To be effective, environment and development education should deal with the dynamics of the physical, biological, social, economic, and spiritual environment (p. 293)". Literacy education, be it formal or environmental, thus becomes a very important part of this holistic view.

Environmental education can play an important role in promoting environmental literacy as its goals include more than acquiring scientific information. It is driven by a

mission: to produce a concerned citizenry that is intellectually and psychologically able to understand environmental concerns of its community and is prepared to make positive choices that could reduce impact of human life styles on the natural environment. This can be successfully addressed if decision making and critical thinking skill are enhanced in low literate communities through environmental education.

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Environmental Education in China: From awareness to Action

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ABSTRACT

China has been facing ever-rising environmental challenges. Chinese environmental educators believe education is a catalyst for social changes and value clarification. The country has seen significant progress on development in environmental education fields. Still Chinese lobbyists need to push for more aggressive measures and corrections of improper move in educational policies. In recent years, NGOs, media, student groups and individual campaigners have proved very effective in educating the public on China's environmental plight and promoting citizen participation. Environmental law education has been encouraged from top leaders to grassroots institutions. Many international organizations have been active for years in spreading environmental messages to Chinese communities, and have made much contribution to environmental education in China. However, problems remain to hamper the introduction of EE curriculums into formal education. Unless Chinese government takes more vigorous measures for environmental education, China's environmental woes would be even harder to deal with.

INTRODUCTION

Just as Rachel Carson's "Silent Spring" awakened the environmental movement in the United States, so does environmental education have an important role to play in China.

Ancient Chinese philosophies inscribe that "Nature and Man are one". This harmonious attitude toward natural environment has shaped minds of Chinese scholars for centuries, and became an important part of Chinese culture, which has expressed through painting, architecture, writings and various other forms.

However, changes of social-economic structures and political arena in this century have led Chinese people to adopt new forms of thinking. One typical legacy of the Maoist era is that nature was seen as something to be conquered.

Decades of wars, political conflicts and social turmoil like Great Cultural Revolution left China with another heritage – high rate of illiteracy in the country's 80%

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rural population. China will enter the 21st Century with more poorly educated people than any other country. But since the 1980s, it has been spending only about 2-3 percent of GNP on education – just half the average developing country level of 4.1 percent. Many Chinese educator criticize Chinese education as merely test preparation.

For the country's industrialization drive, China apparently needs more engineers and technicians than zoologists and conservationists. Under the educational system which designed for sole purpose of provide qualified workforce for "socialism construction", therefore subjects related with ecology are not stressed at school. Facing tense competition for college entrance exams, many schools simply cut hours of those courses for other subjects that were required during the national exams. The practice results in serious ignorance of environmental knowledge among the public.

On the other hand, since 1949, Chinese government has been put maintaining public goods as its priority. Since 1972, a massive governmental network of environmental agencies has been established at different levels. Therefore Chinese people have not traditionally felt responsible for maintain environment outside their houses. Given this mind-set, people have not worried about dumping hazard waste or pouring waste from industries to local streams. It is the governmental responsibility to clean up the environment, not individual citizens.

So environmental education in China has two main objectives: spread general understanding on environmental issues, and promote individual participation in environmental efforts.

Important Events of Environmental Education in China

1973 National Environmental Protection Agency established

1978 The Document "Essentials on Environmental Protection" issued by Central Commission of Chinese Communist Party put "environmental protection knowledge should be added into primary and secondary education"

1980 The State Council and other governmental departments formulated "Environmental Education Development Project Draft" merged into National Education Plan.

1990 Energy, environmental and ecological education was emphasized in " the Draft of Educational Plan for Primary and Secondary Schools of Nine-year Compulsive Education"

1991 "The Syllabus of Compulsive Primary and Secondary School of 1996" produced by State Education Commission required to teach students to understand the fundamental policies of population, resources and environment. And environmental education should be emphasized in Nature course in primary school and physics, chemistry, biology and geography in middle school.

1992 The First national environmental education conference, which presented a guiding principal – Education, is the basis of environmental protection.

1996 The National Action Place for Environmental Publicity and Education (1996-2010) was announced.
1997 Three Environmental Education Center were established in China

SOURCE: ENVIRONMENTAL EDUCATION STATUS IN CHINA, HAO BING AND ZENG HONGYING

Chinese Lobbyists on Environmental Education

Ma Yanchu can be regarded as most famous lobbyist on environmental policies in modern China. In Mao's era, governmental policies encouraged people to have more children and reclaim agricultural land. Ma Yanchu, a follower of Malthusianism and then president of Beijing University, challenged Mao Zhedong's policies and promote population control measures. Later, he paid his life for this insightful opinion.

While in the west, pressure groups' lobbies for policy changes in favor of the environment are common, such independent groups in China are still rare. But this does not mean lobbying activities are rare. Chinese environmental educators have been very active for lobbying educational policy change to give environmental education more weight in schools.

Among high school subjects, geography class consists of most of environmental contents. In early 90s, the then Educational Committee removed geography from the list of required subjects for college entrance examination. This policy has led most schools to downgrade the importance of geography course. Since the very beginning of this policy change, there has been objection at various levels. The complaints from geography teachers are especially strong. A popular magazine "Geographic Knowledge", now famed as Chinese National Geographic, had been publishing articles to express the need to restore geography to its original status, and criticized the policies of the Educational Committee as shortsighted. Besides, the appeals were also sent directly to educational policy-makers.

Another campaign occurred in university circle. In 1997, the Educational Committee was to cancel ecological subjects from environmental sciences major. This means ecology will be far less emphasized in overall study of environmental sciences. Renowned professors from a score of Chinese universities wrote a petition to the Educational Committee to appeal for reverse of the policy. The petition letter had also been circulated among top governmental officials in charge of environmental policies.

Another form of lobby for environmental education occurs in an institutional manner, or between different governmental agencies. Since World Wide Fund for Nature - China Program moved its office to Beijing in 1996, it has been engaged in an active environmental education program. WWF-China approached both State Environmental Protection Agency (SEPA) and the Educational Committee which later became Ministry of Education (MoE), and drew an environmental education master plan to incorporate efforts from both governmental agencies. With the funding support from WWF, the Ministry of

Education set up three environmental education centers desperately in Beijing, Shanghai and Chongqing. The centers offer training sessions for teachers with hope that they would bring the concepts and methods of environmental education back to their home schools.

State Environmental Protection Agency has also been lobbying Chinese authorities to start environmental education program among policy and decision-makers. In 1998, SEPA wrote an environmental textbook for communist party leaders and sent the agency's staffs to teach at the Central Communist Party School, which is a cradle for Chinese high-ranking officials.

Last but not the least, many Chinese environmentalists have been appealing the government through different channels to adopt a more positive approach to introduce environmental education.

Environmental Messengers

Chinese public no longer follows blindly the official line today, and they are tired of doctrine and dogma with traditional teaching methods. Chinese environmental educators have to find a more convincing way to get the message across.

Non-governmental organizations

In China, most of environmental NGOs focus on mass environmental education. Unlike many governmental sponsored environmental education sessions, environmental educators at NGOs are mainly made up of devoted people who really care about how to turn the audience "green" instead of thinking whether they can get paid for doing the job.

China's most well known indigenous environmental group Friends of Nature was started in 1994. Friends of Nature's activities were initially small, with groups of like-minded intellectuals gathering in Beijing's secluded parks to commemorate Earth Day or to discuss environmental issues. They soon began to focus on environmental education, particularly at the primary and secondary school level, and sponsored environmental exhibits in schools, organized environmental lectures for its members. (1)

FON's activities have grown in scope over years. It has published a book titled "Earth Home" and donated a popular environmental literature to several hundred natural reserves. The FON office also maintains a reading room for people who are interested in learning more about environment. FON has also been organizing annual environmental education trip to German and the Netherlands, with the funding from environmental groups

of the two European countries. The participants of the study tour are mostly school and university teachers.

A schoolteacher to protect swans around Rongchen Swan Lake in Shandong Province established another environmental group Rongchen Swan Protection Association. The association drew its members from all walks of life. It holds public exhibition, organizes bird-watching tours for school children to raise the awareness for conservation of swan. Such community education efforts have been very effective at local level, and have drawn much media attention so the plight of swan conservation can be widely heard.

Media

Media has been playing a significant role in promoting environmental awareness in China. A survey in 1990 showed that students learn more than 70% of environmental knowledge from media.(2) Beside professional newspaper like China Environment News and China Green Times, increasing numbers of newspaper start environmental columns and publish environmental message to their respective reader circles.

To support more coverage of environmental issues, Friends of Nature conducts annual survey of Chinese newspapers since 1995. FON' study shows that in 1996, China's seventy newspapers carried 17,555 environment-related articles, and environmental reporting accounted for 1.01% of the total news coverage in 1996, almost double that of 1995. (3) FON surveys were the first institutional research on environmental reporting and have stimulated Chinese newspaper to offer more coverage of environmental issues.

Peer groups—students

Chinese universities have been long been cradle of many social movements, and the environmental field is no exception. Student environmental groups are active in many universities, including Qinghua, Beijing University and Chongqing University. These groups organize environmental lectures, sponsor environmental galas and exhibitions, as well as set up field trips to study environmental problems.

Student environmental groups are universally working on environmental education. Given the fact the all of them are campus-based, they can be very effective and can easily deliver the environmental messages to their fellow students. In March 1996, student groups linked up and formed China Green Student Forum. At present, the China Green Student Forum has most than 30 member groups, and become the most dynamic environmental voice in China.

Student group Green Day of Beijing Institute of Light Industry was the first one the Green Student's Forum helped to set up. Green Day holds a weekly environmental

education program for the kindergarten in the university's surrounding community, and its members volunteer to teach the kids on environmental issues.

Another student group in Southwest China Environmental Volunteer Association of Sichuan University has translated an English environmental education material into Chinese and also integrates English teaching programs with environmental focus.

The rise of student environmental movement on Chinese campuses and the approving coverage their activities receive in the Chinese media testify to a rising environmental consciousness in China.

The Individual campaigners

A few dedicated environmental educators have charmed the public recently. They are mostly well educated, high-profiled figures in other fields and later on started their environmental crusades.

Dr. Li Hao has earned a title "Dr. Earth" from her tireless efforts in bringing environmental messages to the public, particular Chinese children. Li Hao earned a doctorate in immunobiology after eight years study in Germany, but she gave up a medical research position and dedicated herself on environmental education. She has voluntarily lectured at numinous schools, and host environmental columns in several Chinese presses.

She impressed the audience during 1997 China Environmental Forum by her daring face-to-face challenge to executives of multinationals on these companies' environmental records in China. She also works on neighborhood environmental education initiatives through recycling projects and writing environmental kits.

Although individual efforts can not halt the overall trend of environmental degradation in China, a significant message their actions help to deliver is that not only individual can make a difference, but public participation is essential.

Environmental Law Education

The August, 1996 "Decisions on Environmental Protection by the State Council" sets forth national policy and defines national government and regional responsibility for environmental protection just as the United States Congress did in the National Environmental Policy Act of 1969. According to the State Council Decisions, "All regions, departments and units must regard legal knowledge about environmental protection as an important part of the training for their officials and staff. They must raise the awareness of all the officials and the public on the importance of complying with the provisions of the environmental laws." (4)

In 1997, the National People's Congress passed criminal law amendments, which for the first time included the codification of environmental crimes. The environmental provisions impose criminal penalties upon people who severely damage the environment, import solid waste without authorization, hunt or traffic in endangered species, divert farm land to non-farm use, or cut forests in nature reserves or commit other violations of the Forestry Law.

The institution of criminal penalties for environmental offenders is a critical step forward in protecting the Chinese environment. In such a diverse country as China, the central government must depend upon the cooperation of provincial and county level governments to enforce central government regulations. Environmental laws and regulations can only be enforced if many people know about the law and are willing and able to keep the government informed and bring pressure to bear on local and central government to protect the environment. (5)

China Environment News has been a pioneer in promoting environmental law education. The newspaper has a full-page column on environmental law, which studies different cases, examines the articles of the environmental law, and reveals environmental law offenders. Given the fact that the newspaper reaches one million readers, it has made a big impact on promoting understanding of environmental laws in China.

Educational and media efforts to improve public awareness of environmental laws and regulations are part of a larger trend towards operating government and society more and more on the basis of laws and regulations. Chinese President Jiang Zemin wrote in 1996 that although much has been done to improve knowledge of the law among officials and the public, China needs to go much further to build an adequate system of rule-by-law. Jiang said that party and government officials and all Chinese people should study the law and understand the importance of obeying the law. (6)

Chinese government approves public outcry against violations of government environmental and wildlife regulations. Still most of media efforts are directed against specific polluters in support of government environmental regulations. Nonetheless, encouraging the public and the media to expose and condemn polluters creates a dynamic, which may well lead to public pressure for changes in government environmental policy.

International Organization

As China has a high status in global environmental and development issues, few international organizations can ignore this vast country. Recent years China saw increasing number of international institutions working on EE projects in China.

World Conservation Society

In 1996, WCS started its China environmental education project in Yunnan, in cooperation with Kunming Institute of Zoology. Now the program has expanded to three other southern provinces with a focus on wildlife conservation. The society started the Asia Conservation Communication program, which is now based in East China Normal University. The program's pilot projects include tiger conservation education and raising consumer awareness on tiger's plight.

GLOBE

The Chinese GLOBE - Global Learning and Observations to Benefit the Environment -environmental education program for high school students began under a 1995 Sino-American agreement, plans to reach thirty-six schools, and at least one in every Chinese province and autonomous region, by the end of 1999. These regional centers will train teachers and spread the GLOBE program to other schools in their areas.

More Chinese schools are joining the GLOBE program, an international environmental education program that enables high school students worldwide to compare environmental measurements on the Internet. The China GLOBE program was born on October 18, 1995 when Xie Zhenhua, Administrator of the National Environmental Protection Agency (NEPA) of China signed a bilateral GlOBE program environmental education agreement with Ron Brown, the late U.S. Secretary of Commerce. The State Council approved the Globe Implementation Committee composed of officials from NEPA, the Ministry of Foreign Affairs and the State Education Commission.

China's GLOBE Program is now building provincial centers. On the Earth Day, 1996, four schools in China, including the Experimental High School Attached to the Beijing Normal University became the first GLOBE schools in China. In October 1996, eight schools scattered across China joined the GLOBE program. By the end of 1999, each of the 32 provinces, autonomous regions and cities directly under the central government will have at least one GLOBE school. These thirty-six GLOBE schools will be regional GLOBE Program centers responsible for training GLOBE teachers and organizing the local GLOBE program. (7)

LEAD-International Program

Leadership for Environment and Development (LEAD)-China was established in 1993, is one of the 12-national/regional chapters of LEAD International, based in New York.

It recruits 15 promising mid-career young people each year from a broad range of disciplines and sectors to become LEAD Associates for two years. In LEAD but without leaving their jobs, they receive multi-disciplinary training at home and abroad, refine their leadership skills, and translate the concepts and ideas into action toward the sustainable development. They will have more opportunities to pursue their action-oriented ideas after two years when they become LEAD fellows.

It conducts national training, co-organizes international training with LEAD International and other LEAD chapters, implement LEAD fellow program, and provide LEAD associates with LEADnet service to facilitate the learning and communication process.

The core faculty designs and implements the national training curriculum, aiming to achieve a new paradigm for the sustainable development.

LEAD-China has worked with 110 associates of seven cohorts and graduated 60 fellows so far. They have formed a large LEAD network, playing an important role in the field of environment and development both in China and international communities. (8)

US Peace Corp

The Peace Corps has been active in China since 1993. Now there are 53 volunteers in China's southwest Sichuan Province and they serve as critical catalysts for Sino-American understanding by teaching English to language teachers. In addition to language skills, volunteers in China have focused on stimulating critical thinking, embracing problem-solving skills and providing computer training. One significant move the Peace Corps made in recent years is to integrate environmental education in English teaching. The Peace Corps Volunteers in Sichuan has also organized many environmental activities including Earth Day celebrations.

Peace Corps was honored in early September by the National Committee on U.S.-China Relations for the agency's "notable contributions to United States-China relations" and it's other services. Later in 1999, the Peace Corps will expand its China program to Guizhou Province.

International Crane Foundation

ICF is among the earliest international environmental NGOs worked in China. Its educational program in Caohai in Southwest Guizhou province aims to raise awareness for the precarious of Black-necked Cranes wintering in the area and the natural communities in which they live. ICF published children education book designed to teach local natural heritage and importance of saving cranes and its wetland habitats, and their project involved teachers and students at local elementary school. Besides, ICF also works with Trickle Up Program (TUP), which is a poverty alleviation group, to help some Caohai families pay the education of their children especially girls.

Friends of the Earth (Hong Kong)

FoE HK is one of the most vigorous groups that promote environmental education in China. FoE donates it environmental publications and education materials to numerous Chinese institutions, schools and libraries. The group organizes annual environmental summer camp, which involves young people from mainland and Hong Kong to learn about environmental issues. FoE also set up China's first Green Hope School by raising fund through its recycling campaign, and promote integration of environmental teaching in Hope Project which helps to set up schools in poverty stricken areas and prevents school drop-out of children from poor families.

To acknowledge the contribution of environmental educators, FoE set up annual Earth Award in 1996. It consists of two categories: environmental education and environmental reporting. Through the nomination process, FoE has created a network of lesser-known environmental educators who the group supports.

Problems with environmental education

Lack of good-quality environmental education curriculum

Several dozens of environmental education textbooks published in recent years have been developed by environmental researchers or by educators from universities. Owing to lacking of professional environmental educators, most of these textbooks failed to become useful guidebook for environmental education. Most of curriculum developers still pay more attention to environmental factual knowledge instead of environmental values and critical thinking.

Unfavorable education system

Still for most of Chinese students, studying is to pass exams, go to university and find a good job. This attitude is common. "Academic scores" is the concrete principle of evaluation for education. So without a fundamental education reform, it is difficult to integrate environmental education into formal education. So far education evaluation system is still an obstacle for school to pay more attention on environmental education.

Greater efforts needed on understanding of global environment

Ms. Elizabeth Economy of the Council on Foreign Relations writes that China has placed the burden of global environmental problems on the rest of the world. Issues such as global climate change and ozone depletion are more diffuse and long-term than China's current woes. Chinese officials have resisted devoting financial resources to problems that they could blame on industrialized countries, a philosophy best summed up as "For China to play, the world must pay." (9)

As China will need more money to solve its domestic environmental problems, it is understandable that the government is reluctant to channel resources for global environmental problems. But the reluctance for China to involve more internationally has another reason -- relatively low awareness on global environmental issues, which leads to low incentive for taking actions.

Interestingly, in China's environmental education efforts, global environmental issues have been widely highlighted. However, what the public needs to understand more is how their lifestyle such as consuming behaviors can contribute environmental problems that are global in scale.

CONCLUSION

More and more people in China are realizing environmental education would be a effective weapon to combat mounting environmental problems. And the slow changing of people's minds is making and will make the difference. However, the time lag still exists. Environmental education efforts would still be modest and slow to reverse the rapid degradation of China's ecosystem. The country needs more dramatic events like Greenpeace-style direct actions to gave China a lasting alarm call.

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Capacity Building for Biodiversity Conservation in VietNam

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ABSTRACT

This paper presents an informal look at the results of the first GEF project to be implemented in Viet Nam, beginning in 1992. The project was designed to strengthen the capacity for conservation work in Viet Nam through training and planning. The two project components were the preparation of a Biodiversity Action Plan and capacity building through training.

While most training and planning projects are not considered to be innovative, in fact the very timing of these activities in Viet Nam led to a significant impact for the nation's conservation sector. Often times, training is considered to be an "add-on" activity to a larger field-based project, but in the case of the first GEF project for Viet Nam, training was the core activity -- training for the sake of training.

In fact, the project results are impressive. A total of nearly 2,000 conservation officials and staff were directly served by this project, making it one of the most well-known projects in the country. It is quite difficult to visit any district forestry unit or nature reserve in the country without meeting at least several conservation staff who trained by the project. This not only created a trained core of staff, it literally propped up and strengthened the entire foundation for the delivery of conservation programmes in Viet Nam.

By using locally adapted training materials, targeting field staff who were previously under-served in training and supporting this with specialized training targeted at senior officials, the project provided a balanced training approach. The author of this paper was the participant of an intensive course on field biology under the project.

INTRODUCTION

The first trance/pilot phase GEF project in Viet Nam, implemented from 1992-1999, aimed to strengthen the capacity of the Viet Nam Government to implement programmes for protecting areas of high Biodiversity importance through a broad range of

training activities for forest guards, rangers, area managers, technicians, scientists and at senior government levels, both in country and through overseas fellowships and study tours.

An important supplementary activity of the project was to build upon existing plans and strategies to develop a Biodiversity Action Plan (BAP) outlining a timeframe of coated actions necessary to preserve the nation's precious Biodiversity, to reduce loss of forest, and to safeguard water catchments and the ozone layer.

UNDP and the Government of Viet Nam signed the project document on 31 July 1992. Implementation commenced in late 1992, and the CTA was fielded in November 1992. However, due to the rapidly changing situation in Viet Nam at that time, the project was significantly re-designed and operational activities started in earnest in early 1993.

The development objective of the project was to prepare the Government for the implementation of national and provincial programmes to protect areas of high Biodiversity importance through the preparation of the BAP. To achieve this development objective, five immediate objectives were specified:

1. Draft, discuss and approve a Biodiversity Action Plan to serve as the primary guiding blueprint to achieve conservation of Biodiversity in Viet Nam at the national and provincial levels and to present an accurate and up-to-date assessment of the Biodiversity status in Viet Nam.

2. Introduce integrated forest management and community extension skills through conservation field training provided for local, provincial and central officials responsible for managing areas of high Biodiversity value in Viet Nam. Special emphasis is taken in all field training programmes to enroll local community leaders, particularly women and members of local ethnic groups.

3. Increase awareness about Biodiversity conservation and enhance mid and high level management of protected areas by providing international training and study tours for a select group of park managers, biologists, local administrators, and trainers in order to update these officials with current knowledge and approaches to protected areas and wildlife management, and providing for the improvement of English language skills to enhance their overall comprehension of the training.

4. Improve the institutional capability for pre-service and in-service training in the Ministry of Agriculture and Rural Development and strengthen the capacity of Forestry, the Ministry of Sciences, Technology and Environment, and other key government agencies in management capabilities to carry out conservation project.

5. Strengthen the capability of the Forest Inventory and Planning Institute (FIPI) and other concerned agencies in GIS and environmental monitoring, allowing FIPI to a occurately assess the status of forests in Viet Nam. Newly compiled and packaged information will be presented visually in maps as part of the BAP, laying the foundation for more relevant conservation strategies and ongoing environmental monitoring in Viet Nam.

The project was executed by the United Nations Office for Project Services (UNOPS) through the UNDP Hanoi office. The Forest Protection Department (FPD) in the Ministry of Agriculture and Rural Development (MARD) and the National Environmental Agency (NEA) under the Ministry of Sciences, Technology and Environment (MOSTE) were the national implementing agencies. FPD was responsible for conservation training and NEA was responsible for the BAP component. In addition, the World Wide Fund for Nature - WWF Viet Nam Programme and the World Conservation Union (IUCN) served as international sub-contractors for the above two components respectively.

The project was designed to benefit and involve many institutions, ministries and agencies who were concerned with and/or responsible for the forest conservation and Biodiversity in Viet Nam, including the Forest Inventory and Planning Institute (FIPI), the Forestry College, and the Institute of Ecology and Biological Resources (IEBR). Accordingly, the Government entrusted the management of the project to a Steering Committee (SC) chaired by a Deputy Minister of MARD and consisting of other members agencies: the Ministry of Planning and Investment (MPI), MOSTE, and UNDP.

MATERIALS AND METHODS

The "Conservation Training and Biodiversity Action Plan" project generated global benefits for Biodiversity by strengthening the capacity of the Government of Viet Nam and its staff at the central, provincial, district and local levels. Viet Nam continues to demonstrate its rich endemic Biodiversity. Much publicity was generated about the discovery of three large mammal species in 1992[2], 1994[3] and most recently the Truong Son muntjac[4] which was discovered in 1997 and has been named after the mountain range

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2 The description of the saola (Pseudoryx nghetinhensis), which is also sometimes referred to as the Vu Quang ox, is found in -- Vu Van Dung, et. al., "A new species of living bovid from Vietnam", Nature, Vol. 363, 3 June 1993, pp. 443-445.

3 The description of the Giant Muntjac (Megamuntiacus vuquangensis) is found in -- Do Tuoc, et. al., Môt Loài Thú Môi Phát Hiên O Viêt Nam (Description of a new Large Mammal Species in Vietnam), Forest Inventory and Planning Institute (FIPI), Occasional Paper 3/1994, June 1994.

4 P.M. Giao, et. al., "Description of Muntiacus truongsonensis, a new species of muntjac from Central Vietnam, and implications for conservation", Animal Conservation (1998) 1, 61-68, Zoological Society of London.

which form the western border of Viet Nam with the Lao PDR. But beyond these spectacular events, over the last twelve months in Viet Nam, a new species of bird has been described in the Ngoc Linh highlands area, a new species of rabbit was found (which is being described in coordination with scientists in the Lao PDR), and the first ever photographs of the Vietnamese sub-species of the Javan rhinoceros were taken by remote camera-trap in Cat Tien National Park (one of the GEF training sites). The photographs, which were released in July 1999 received extensive national and international coverage.

Each of these startling finds points to the global benefits that are derived from improving Viet Nam's management of these valuable biological and genetic resources. Viet Nam is a country of global Biodiversity significance. The Viet Nam GEF project has proven that investing in training and professional development which reaches down to the field level can lead to increased capacity as well as measurable conservation achievements.

While the basic premise of the first GEF project in Viet Nam was training, the methods employed for training were designed to meet the special conditions of the country. Due to the dearth of local training institutions and local training materials when the project was initially designed, the project had to take a two-pronged approach. Three Biodiversity training centres were set up, constructed, and supported by the project. Housing these training facilities within existing protected areas provided a location where there was a local stake in sustaining the centre infrastructure and there was a ready pool of trainees. After consideration by the project designers, it was decided to set up the three Biodiversity conservation training centres at Cuc Phuong National Park in the north, Bach Ma National Park in the central region, and Cat Tien National Park in the south.

Numbers of Trainees in the Viet Nam GEF Project

VietNam GEF Project Training Results	National Training	International Training
Field-level courses (1-2 months)	1,644	
Workshops and Intensive Training (1-2 weeks)	205	5
Short-term Specialised Training (1-6 months)	13	7
Study Tours (1-3 weeks)		52
Graduate Degree Programmes (MSc level)		10

Course materials for the training centres also needed to be developed from scratch, so instructors and conservation technicians were brought to Viet Nam from the Wildlife Institute of India and the Smithsonian Institution. They designed courses for forest guards,

for protected area managers, and for field biologists. All materials were translated into Vietnamese, and the initial courses were co-taught with the international advisors and local instructors from various teaching institutions in Viet Nam. A total of 45 field courses were offered for over 1,800 field-level staff at these training centres. Now that the project has been concluded, the training facilities have been turned over to the three protected areas, and the future training target group, covered from other funding sources will be local people from the areas surrounding the protected areas.

At the conclusion of the field training courses, each training participant filled out an evaluation form. These were collated and kept at the project office, forming an important source of feedback and evaluation. Additionally, a training profile was kept for each trainee undertaking both national and international training, and staff promotions, changes in job descriptions and improvements in staff performance were monitored. The records of this overall training profile are maintained by the Forest Protection Department, and are serving as an important database now that Viet Nam's protected area system is being expanded.

At the Forestry University of Viet Nam (FUV), the preparation of a new curriculum for a series of three Biodiversity courses, has also led to a self-sustaining impact. Two young FUV staff were sent abroad for Master degree courses, and they will be the primary instructors of the new courses. These new courses at FUV will serve the next generation of conservation providers in Viet Nam.

Stakeholder Involvement

In Viet Nam, there is a pattern for stakeholder involvement which differs somewhat from less centrally planned countries. In the case of training, every effort has been made to include a broad section of the protected area officials, local, district and provincial staff and local people (particularly community leaders such as representatives of the People's Committees, school teachers, and members of the Farmer's Association).

While these efforts could be judged to be successful, and in fact they were, there were several shortcomings in this methodology and approach:

* *Involvement of Women*

One short-coming in the approach of using traditional Vietnamese mechanisms for stakeholder involvement was related the involvement of women, who are not traditionally as active in the forestry sector as the project implementers would have wanted. Despite the important role that women play in the collection of firewood or non-timber forest products, their direct participation in training for forest protection and conservation activities was slow to be accepted.

While participation in training by females was only about 7% of total trainees even

after strong efforts for outreach, this is greater than the 2% of women who make up the Forest Guard target group. In international scholarships, women accounted for 20% of the participants -- which reflects the trend that most women who do work in the forestry sector are not field-level staff but are generally centrally based and working on planning and policy issues.

**Involvement of NGOs*

The main limiting factor for the involvement of NGOs in the project was that local NGOs as generally defined do not exist in Viet Nam. However, many of the stakeholders, such as Provincial Forest Protection Departments, are in many ways operating like NGOs in that they are staffed by local people, have small budgets, and undertake a variety of outreach activities.

Leveraging Funds

Important efforts to leverage additional funding for the project was not a goal in the original project design. However, efforts to leverage support for training was undertaken throughout the project implementation period. While the Viet Nam GEF project was "ahead of the curve" in project implementation for protected areas and conservation in Viet Nam, it did take advantage of the limited leveraging opportunities that were available, most notably in conjunction with some major field-level projects funded by the EU and the Royal Netherlands Government.

RESULT AND DISCUSSION

The importance of the first GEF project in Viet Nam is now greater than originally anticipated when the Project Document was first conceived in 1991.
An increased awareness of the environmental and economic importance of Biodiversity conservation by the Government of Viet Nam enhanced the positive effects to be garnered from implementation of the project.

Now that the project has been completed, it is important to discuss the methods which were adopted for sustaining the project achievements. Arrangements such as the adoption of a Biodiversity course curricula at government-operated training centres such as the Dong Anh Refresher Training Centre and the development of a long-term "sister school" arrangement between the Forestry University of Viet Nam (FUV) and Colorado State University in North America which was signed at CSU in May 1999 are good examples of sustaining activities.

The need for sustaining the achievements of the project, and trying to develop clever methods for doing this, is the main lesson learned.

MEMORANDUM OF UNDERSTANDING
FUV -- CSU

In recognition of their mutual educational, research, and scholarly interests, the **Forestry University of Viet Nam** and **Colorado State University** propose to further their interests in accordance with this MOU.

1. The purpose is to encourage voluntary interaction and cooperation between the two parties and to promote professional ties and mutual understanding and good will between the two parties for their mutual benefit.
2. FUV and CSU recognise the value of cooperative educational and research experiences that integrate theory and practice in the management of natural resources and promote international cooperation.
3. FUV and CSU anticipate a close relationship in order to share the benefits of their respective institutional accomplishments, to discuss the frameworks of their different educational systems, and to develop future areas of cooperation.
4. FUV and CSU may encourage their respective faculty and students to pursue collaborative research that is jointly beneficial to their professional development and will lead to increased understanding between the parties and their respective countries.
5. FUV and CSU encourage and welcome the visits of their scientists and scholars to deliver lectures and seminars, to engage in collaborative research in areas of common interest, and to explore mutual projects and the means to support them.
6. Base on this project, since 1995 FPD has mobilized financial support from various international donors such as US Fish and Wildlife Service, Global Tiger Forum, IUCN, etc. to organize a number of particular training courses on Tiger Conservation, CITES Enforcement, and Wildlife Management.

CONCLUSIONS

The successes of the first GEF project in Viet Nam were as much a result of good timing in project implementation as they were of good project design. The main lesson to learn or replicate is to design bold projects, to take advantage of new funding opportunities (this project was designed during the GEF Pilot phase), and to never overlook the critical importance of capacity building and training.

Following a slow start-up in 1992-93, the project has now over-achieved its training targets. The project period has been extended in part from the slow start-up, but also because of the leveraging of certain project activities being picked up by other donors and implementing agencies.

The Viet Nam GEF project has clearly done well, especially considering the extremely ambitious targets which were set when the project was formulated in 1991. The approval and subsequent printing of the Biodiversity Action Plan were clearly major successes for the Global Environment Facility. The quality of the document was

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specifically praised by the World Bank representative at the Government presentation symposium held in Hanoi in May 1996.

Training for conservation officials has also largely gone according to schedule, following some initial delays in the first year of project implementation. The endorsement of the field curricula by the MARD training centres in Hanoi and Song Be is testament to the quality of the preparation work undertaken by the GEF project staff and the curriculum development consultants from the Wildlife Institute of India and the Smithsonian Institution. Adopting this curricula at functioning training centres also assures sustainable results of the project.

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Environmental Education in The Philippines : Status And Challenges

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ABSTRACT

The Philippines has embarked on environmental education as early as the 1900s in the form of forest conservation program. Through the years it has expanded its program to include environmental concerns other than those of the forests. Today, concerns like global climate change, el nino, la nina, waste management, pollution abatement, desertification and a lot more are given attention in education.

The strategies of environmental education have also diversified from purely informal to more formal ones and from using simple media to multimedia approach. Informal and non-degree programs include short term training courses; outdoor recreation education; symposia; public fora; television plugs; and prints such as posters, newspaper bulletins etc. Under the formal programs are environmental curricula in the primary, secondary, tertiary and graduate education of the country.

The University of the Philippines Los Banos is one of the forerunner institutions in the country that has committed itself to environmental education. The College of Forestry and Natural Resources had been in the serious business of providing baccalaureate, diploma and graduate programs in forestry and environment for 8 decades now. It continuously update and/or develop courses in forestry, natural resources and the environment to keep abreast with the ever changing environment. It also offers non-degree continuing education program in these three fields.

The challenge confronting environmental educators now is to succeed not only in expanding the knowledge base of people about the environment but more importantly in making these people move and act for the restoration and protection of the environment from further destruction.

INTRODUCTION

The drastic changes in the environment and climate have awakened the populace to the realization that something concrete and significant must be done to stop environmental

degradation and insure environmental rehabilitation and restoration. Although there were efforts at environmental education earlier on, the impact apparently has not been that significant. The information about the state of the environment may have been available all along, but information on the ways by which it can be improved or rehabilitated and the things that contribute to its further degradation may not be widely accessible and not widely disseminated. It could also be that the information although available are not clear to the greater majority.

The need for strengthening environmental education to correct its previous flaws and weaknesses is pressing. Efforts at environmental education now should not only succeed in bringing necessary information to the populace but should be able to teach people what to do and to move people to do what they are suppose to do.

The Philippines has endeavored at environmental education as early as the 1900s. The first effort was in the form of forest conservation program which incorporated lessons on what general benefits will accrue to the people from forest conservation; what causes forest destruction; what negative effects would forest destruction result to; how to conserve forest resources; and what an individual can do to contribute to forest conservation. The program however was not that extensive to reach the greater majority of the populace.

MATERIALS AND METHODS

The methodology used by the author to determine and trace the development of environmental education in the Philippines was largely dependent upon review of documents and papers available in the library of the University of the Philippines Los Banos (UPLB) and its College of Forestry and Natural Resources (CFNR). The author's personal knowledge of these developments were also included in this study.

The author focused on tracing the development of environmental education in UPLB specifically at CFNR because it represents the significant part of environmental education development in the country.

The change in form, strategy and methodology of environmental education program was specifically given attention and analyzed. The past and current environmental education programs were classified into formal and non-formal/informal in the study. The degree-giving programs were classified as formal educational programs. Short term non-degree programs were grouped into the non-formal programs. Current efforts at environmental education in the university and in the country were also monitored.

DISCUSSION

Brief History of Environmental Education in the Philippines

A. Formal Education

The UPLB College of Forestry and Natural Resources (UPLBCFNR) was the very first academic institution in the Philippines established to undertake the offering of formal programs in forestry. It was established in 1910 and opened with the Forest Ranger Certificate program as its first curricular offering. Forestry, the science and art of managing the forest for man's greatest benefit, was at that time, the closest field to today's environmental science.

In 1924, the College offered the first baccalaureate program in Forestry. The program has undergone a number of revisions to its present form today. One of the striking features of the current program is its heavy environmental orientation.

With the strengthening of the college teaching staff, the college expanded its program to include the offering of a master's degree in 1966. In 1973, the offering of the Doctor of Philosophy in Forestry followed.

The College was also instrumental in incorporating environmental education in the country's elementary or primary education curriculum. In 1995, forest conservation principles were integrated in the "*Edukasyong Pantahanan at Pangkabuhayan*" course in the elementary curriculum.

UPLB in 1997 developed an umbrella program on environmental science involving almost all its colleges including CFNR. The programs instituted were the Master of Science (MS) in Environmental Science, MS in Environmental Studies and Doctor of Philosophy in Environmental Science.

Other academic institutions in the country, public and private, have also involved themselves in environmental education and offering formal, degree-giving programs. Academic programs on environmental science; environmental planning and management; environmental engineering; environmental management; environmental studies; urban and regional planning; and environmental resource management are offered in both undergraduate and graduate curricula. To date, about 25 colleges and universities are in the business of undertaking formal academic programs in environmental science.

B. Informal Programs

CFNR was also one of the agencies in the country that initiated informal programs designed to inform the public about forest, nature and the environment. Alongside its formal programs in forestry, it also undertook a number of informal programs. In June 20,1963, from a less organized series of activities it started, it launched a more organized informal program.

CFNR went into a number of activities. It launched a radio program on forest conservation. It started publishing a regular newsletter devoted to articles on forest conservation and environmental concerns. It also conducted a number of short courses on environmental education.

In 1985, the Institute of Forest Conservation (IFC) was established under the college. It took charge of the college's training and extension activities as well as the development and conservation of the Makiling Forest Reserve. Regular international and local short term training courses in forestry and environmental education were conducted since then.

Other informal programs to provide avenues for scientific discussion of environmental concerns were also implemented. It included outdoor recreation education program, symposia, public fora, conferences and community meetings.

Other institutions have also gone into informal environmental education programs. On March 4, 1988 UPLB and these other institutions formed a network with the primary objective of "promoting the advancement of environmental education" in the country (EENP Brief 1999). The network was named Environmental Education Network of the Philippines.

DEVELOPMENT OF FORMAL ENVIRONMENTAL EDUCATION PROGRAMS

The first formal environmental education program in the country was a certificate program in forestry offered in 1910 by the University of the Philippines (UP). Formal programs have since then increased and now include baccalaureate, master and doctoral program. Environmental education is even integrated now in primary education.

The teaching of environmental science progressed from a mere part of a curriculum to a full blown curriculum in itself. From just a part of forestry curriculum before, it is now offered as a program in itself.

The number of colleges and universities now involved in the teaching of environment courses has also increased.

1. Undergraduate or Baccalaureate Program

As stated earlier, the closest to environmental science curriculum opened to the studentry in the early 1900 is a course in forestry. Although then the program included a course in forest conservation, the focus was more on timber harvesting and utilization. Environmental concern was not a big issue then. At that time the scale of deforestation was not as alarming and its cumulative effect was not that threatening as it is today.

The shift in the philosophy of forestry gradually came about with the changes that occurred through time. Environmental issues gradually became a significant part of CFNR's forestry curricular program. From the traditional forestry courses concerned more on maximizing utilization of existing forest resources, new courses were incorporated focusing on principles and practice that would insure supply of forest products. The succeeding revisions of the forestry curriculum gave way to the inclusion of courses that reflected the change in philosophy of forestry that the college has adopted. The forest is now viewed not only as a resource base but the environment itself. In its current undergraduate program, the basic and foundation courses are well anchored on socioecological principles. The package of courses was developed following the concept that forestry is an art and science of sustaining the life support system afforded by the forest. The current BS Forestry program is a 4-year program with specializations in a number of fields that reflect the paradigm shift the college adheres to
(Table1).

Table 1. Field of specialization options in the BS Forestry program of the UPLB College of Forestry and Natural Resources

Forest Biological Sciences
Silviculture and Forest Influences
Forest Resources Management
Social Forestry
Forest and Natural Resources Governance
Forest Products

The College of Forestry and Natural Resources' current programs have been developed in line with its overall thrust. " Forest, Natural Resources, Environment and People" is reflective of the philosophy of forestry mentioned in the previous paragraph. The college recognizes that the forest should be viewed in the wider context of environmental stability and that it should be managed for the benefit of the people. As such its efforts at educating its students and the relevant publics are largely founded in this philosophy.

2. Graduate Programs

The inclusion of environmental education in forestry graduate programs

particularly in the master's degree followed the same pattern as that of the undergraduate programs. The institution of the doctoral program occurred much later and at a time when concerns for environment are surfacing. As such, the program took off with stronger environmental background compared to the beginning of the master's program. Courses instituted under the program have basic environmental science foundation. In recent years, specific courses on environmental forestry, urban forestry, environmental impact assessment, tropical forests and climate change and forest biodiversity conservation were developed. The importance of the integrated watershed management approach as an environmental management approach was highlighted in number of forest management courses. The concept of sustainable resource management was incorporated in all relevant courses. All these additions and revisions were made in the current forestry graduate programs offered by the college shown in the succeeding Table:

Table 2. Current graduate degree programs of the UPLB College of Forestry and Natural Resources.

Degree	Major Field
MF, MSF, PhD F*	Forest Biological Sciences
MF, MSF, PhD F	Forest Resources Management
MF, MSF	Social Forestry
MF, MSF, PhD F	Silviculture & Forest Influences
MF, MSF, PhD	Wood Science and Technology
Diploma in Agroforestry	

*MF, Master of Forestry; MSF, Master of Science in Forestry, PhD F, Doctor of Philosophy in Forestry

The need for a program that would focus on the whole environment led to the institution of a graduate program in environmental science in 1997. Although to a certain extent, the existing graduate program in forestry has satisfied the need for formal programs on environment, it is limited only to concerns within and attributable to, the forest. The new program focused on wider concerns and dealt with "theoretical and methodological issues of environmental science and management" (SESAM 1999). Concerns on pollution, environmental rehabilitation of non-forest areas like coastal resources and other changes in the environment and how they can be managed are given attention in this new program. Prospective graduates of this program are expected to upgrade their knowledge and develop skills on environmental analysis, planning and management.

This program is a university-wide program drawing on the strengths of its constituent college. A unit, School of Environmental Science and Management, was

established in the university for the purpose of coordinating the efforts and programs of the constituent colleges. The list of courses offered by the College of Forestry and Natural Resources which can be taken by students under this new program is given in Annex A.

The UPLB graduate programs in environmental science and the respective major fields open to graduate students are shown in Table 3.

Table 3. UPLB graduate curricular program in environmental science.

Degree	Major Field
Master of Science in Environmental Science	Environmental Planning and Management
"	Environmental Restoration
"	Community-based Resource Management
"	Protected Area Management
"	Environmental Chemistry and Toxicology
"	Environmental Biology
Doctor of Philosophy in Environmental Scienc	Environmental Security and Management
"	Protected Areas Planning and Management
"	Social Theory and Environment

CFNR is now in the process of instituting another graduate program on environment. In the pipeline is the Master of Science in Natural Resources Conservation program. The program is envisioned to develop in its graduates the ability to plan and effectively manage for conservation renewable natural resources with the ultimate goal of insuring the wholesome, sustaining state of the environment.

3. Environmental Education at the Elementary or Primary Level

The efforts of CFNR in environmental education is not limited only on tertiary and graduate education level. It has spearheaded the development of the curriculum on forest conservation and biodiversity conservation and its integration in one of the subjects/courses in elementary education in public schools of the country. The college was also involved in enhancing the capability of elementary teachers in handling said course.

DEVELOPMENT OF INFORMAL PROGRAMS

The informal programs designed at educating the populace on environment were numerous. Unlike the formal programs, more institutions, public and private or non-government organizations (NGOs) have been involved since the beginning. The

responsibility of environmental education however was more lodged in government agencies before. Now, more and more private institutions are getting involved.

As mentioned previously, the earliest effort at environmental education in the country is through a forest conservation program. Through time the focus broadened and pertained to concerns involving other natural resources. Environmental issues and concerns have diversified. Today there are educational programs on water resources, aquatic and marine resources, other land or terrestial resources, atmospheric resources and how they are threatened and endangered by developments.

The strategies of delivering these programs have also multiplied and become more sophisticated. From simple posters, print and radio broadcasts, usually in local media with limited circulation or reach, educational programs now have improved tremendously in form and style. Informal non-degree programs of environmental education are now in the form of short training courses, outdoor recreation education program, innovative television and radio plugs, poster and print layouts. Holding of conferences, symposium, forum, scientific meetings, and community gatherings for the purpose of environmental education is becoming a popular strategy too.

The College of Forestry and Natural Resources has actively involved itself in almost all these programs. It takes pride in leading other institutions in the country and in other countries in managing short training courses on forestry, the environment and related fields. It has undertaken a comprehensive information, education, communication (IEC) program on mountain ecosystems particularly tropical forests.

1. Radio, Television and Print Media

The CFNR's efforts at forest conservation and environmental education were boosted when Republic Act (RA) 3523 was passed by Congress in June 20, 1963. This law mandated the college "to undertake nationwide public education and information program in forestry to bring about general public appreciation of forest values". To effectively carry out this mandate the college mapped out and implemented a forestry extension program in the country. Satellite offices were established in northern and southern Philippines to take charge of extension activities in these parts of the country. The college launched the newsprint *Makiling News* and later in 1966, a radio program "*Kadluan ng Yaman*" for the purpose of nationwide public environmental education. At the same time, the college also published hundreds of the poster "Trees" and "Let Us Save the Environment" which illustrated the benefits that people get from trees and the environment. A film on forest conservation and the environment was also produced and shown in a number of schools and offices nationwide.

The college has sustained the publication of *Makiling News* up to the present. The radio program went on air till 1995. Four thousand copies of the two posters were reprinted in 1995 from funds provided by a civic organization, the Rotary Club of Makati

Legazpi. Brochures, leaflets, slide tape presentations and video productions were prepared and distributed to as many people possible. The drying out of logistical support of the government to the program in the 80s resulted to the program's gradual loss of vigor.

Today the college takes all the opportunity available to go on air and television as well as in dailies to discuss topics on tropical forests and climate change, deforestation and desertification, soil and water conservation, biodiversity conservation, logging ban and sustainable forest management.

In addition to the efforts of the college, other institutions within the university and outside have also undertaken environmental education using radio, television and print media. The participation of big corporations in the information drive has significantly boosted efforts at environmental education of the nation. Innovative TV and radio plugs, newspaper advertisements about the environment have caught the attention of millions of people particularly the youth. The multimedia approach had been effective in getting the attention of more audience.

2. Short Training Courses

The short training courses on forestry and the environment of CFNR became more potent tools in educating people when the Institute of Forest Conservation was created in 1985. The organization and structures created within the institute have increased the effectiveness of delivering the courses. Before this date, the college has conducted several batches of short training course on forestry education which was funded by the Food and Agriculture Organization (FAO) for forestry teachers of the Asia-Pacific region.

The college did not only offer courses on environment per se but participated also in providing opportunities for interested individuals to learn the basics and methods of undertaking environmental education programs. Short term courses of this type offered by the college include the Forestry Training and Education Development Course, Forestry Extension Course, Trainers Training on Environmental Education, Training Youth Program for Environmental Education among others. The college has so far trained thousands of foresters and allied personnel from a number of countries in Asia, Africa, the Pacific region and America.

There are other institutions now which also offer short courses on environment. The college takes pride in leading these institutions and making the first mark in environmental education through short term courses.

3. Conferences, Symposium and Public Forum

The deterioration of the environment has provided a loud signal for people to meet and discuss issues of pressing concern and identify solutions to it. Conferences, symposia, public fora and meetings have become popular venues for this activity. People who

gathered in these meetings have increased and diversified tremendously cutting geographical and cultural barriers. The Philippines through a number of its agencies like CFNR have organized international and global conferences, symposia and meetings to discuss global environmental issues like tropical forests and climate change, biodiversity conservation and *el nino* and *la nina*.

Local conferences and symposia were also organized on these mega issues and watershed conservation, climate change, water resources pricing, pollution abatement, environmental rehabilitation or restoration and others.

The activities undertaken by the college of this category is numerous and noteworthy.

THE CHALLENGE AHEAD

A lot of institutions are now becoming involved in environmental education which manifests the growing concern for the state of the environment. At this time however when real action in environmental rehabilitation and restoration is needed, the success of environmental education should be gauged on the extent to which it has moved people to act. Environmental education needed at this time should not only strive at upgrading the knowledge base of people but also their skills and attitude. There are so many factors which should be considered to attain these educational objectives. The challenge right now is to be able to identify environmental measures which people can apply to rehabilitate or restore environment that will be compatible with their lifestyle and will not compromise their efforts for survival. Practical options for action should be identified and disseminated to the people.

REFFERENCE

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School of Environmental Science and Management (SESAM) Brochure, 1999

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Environmental Education Route (Repling – Rute Pendidikan Lingkungan) in Conservation Area

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ABSTRACT

Indonesia is known as the third richest country in biodiversity in the world after Brazil and Zaire. Indonesia, which covers only 1.3% of the Earth's surface, has an abundant of wildlife species and ecosystem that are found nowhere else in the world. Indonesia has approximately 10% species of flowering plants, 12% species of mammals, 17% species of birds, 16% species of reptile and amphibian and 35% species of fish of the world's species. It is all in about 114 billion hectares land in Indonesia covered by tropical forests. However, today Indonesia is facing biodiversity and environment problem, which not only will threaten the existing plants and animals life but also the human life system. For this reason society must be made aware of environmental problem ands and of biodiversity and social involvement has an important role in conservation efforts. Younger generations also, who stand as decision makers of the future, should follow patterns of thinking and action with reflect awareness of the environment.

In order to increase people's understanding environmental problems and also conservation biodiversity , RMI has developed an environmental education route program known as REPLING(Rute Pendidikan Lingkungan), which focuses on creating a network of natural trails, and was first developed in Bogor Botanic Garden in 1994. This program is aimed at inviting people to learn about the wealth of natural resources, the problems currently faced, and conservation efforts in Indonesia. The primary target group is get being the general public.

INTRODUCTION

A.1. Environmental Education Needs in Indonesia

Indonesia is well-known as one of the only six mega-diversity countries in the world because of the riches of her biodiversity. Almost 40 million Indonesian people

depend directly on this resource, in which they use almost 6,000 species of plant and animal for daily life. But it is known that Indonesia faces problem with biodiversity degradation and depletion due to the over exploitation. The biodiversity depletion will not only threaten existing species of plant and animal, but will directly threaten life system of 190 million Indonesian people. Environmental problems also faced by Indonesian urban people especially who live in big cities. Jakarta could be taken as an example. According to research done by UNEP, Jakarta is the third city in the world (after Mexico and Bangkok) for air pollution. Besides that water, land and noise pollution also increase. This environmental situation cause health problems among Jakarta.

Environmental damage and biodiversity depletion in Indonesia emerge due to the mismanagement, and lack of awareness of decision maker and other member of society on the needs on environmental and biodiversity conservation. A way to poster clear awareness on environmental and biodiversity conservation is environmental education. It is also to create new pattern of behavior of individuals, groups, and society as a whole towards the environment.

Botanic garden, farm area, etc. as ex-situ conservation area and national park, natural reserve, etc. as in-situ conservation area, are only one of thousand place which can be used as media for increasing awareness on environmental and biodiversity conservation. In Indonesia, those place are rarely used for that purpose.

A.2. Environmental Education Route (REPLING – Rute Pendidikan ingkungan) in Conservation Area

RMI (the Indonesian Institute for Forest and Environment) is an Indonesian NGO founded to foster the conservation in Indonesia by developing studies and field action programs related to protection, preservation, and utilization of natural resources for prosperity of community. It is legally constituted by Notary Muljani Sjafei SH on September 18, 1992 in Bogor.

As an effort to increase the public awareness, RMI has been developing some environmental education programs in two public awareness level of activity, which are field level public awareness and information level public awareness.

One of program in RMI's Field Level Public Awareness Programs are conducted in two kinds of conservation area, which are ex-situ and in-situ conservation areas. So far, the ex-situ conservation area used as media for the programs is botanic garden, meanwhile the in-situ conservation area used as media for the programs is nature reserve. One of on-going program is Environmental Education Route(to be called REPLING as abbreviation of Rute Pendidikan Lingkungan).

B. GOAL AND OBJECTIVES

The REPLING Program is an environmental and biodiversity education project to increase public awareness on environmental and biodiversity conservation. The

program is aimed at inviting people to learn about the wealth of biodiversity, the problem currently faced, and conservation efforts in Indonesia. The primary target group is younger generation (schoolchildren) with the second target being the general public.

C. MATERIAL AND METHOD

The REPLING Program is carried out using two methods of nature interpretation.Guiding Interpretation and Self-Interpretation. With guiding interpretation, participants follow the trails in group aided by facilitators. People using the Self-Interpretation approach learn about biodiversity along the trails on their own, with help the booklets, maps and information markers.

In this program, we involve facilitators. Facilitator is volunteer who are chosen and trained to create and relaxed atmosphere for learning, and there has already signed a great interest among the public becoming a facilitator.

They come from some background, such as housewives, university student, employment, teacher, local community, and also staff of botanic garden and nature reserve. Every year, we open an opportunity to join as facilitator.

C.1.The Target Group

In order to conduct the program the target group of program is divided in order to classification by age which are consisted of :

- Age-group 5 – 8 years
- Age-group 9 – 12 years
- Age-group 13 years –up, each group consists of 8 persons

C.2. Developing REPLING Program

There are some stage to develop REPLING program in conservation area which already has been conducted, as follow :

a. Formulation of the Routes

The REPLING program has provided trails as known routes which contains some alternative routes which each one possessing of uniqueness of its own. The formulation of the routes are started by survey in the conservation area to explore the potential of natural resources in that conservation area.

For example in the Bogor Botanic Garden, we have four alternative route which was developed, such as : the "Green Route" highlights the natural beauty of plant-life, the ecosystem of forest, its relation ship the role of animal species in human life; the "Red Route" focuses on biodiversity ornamental plants; the "Yellow Route" looks a biodiversity, the use plant for medicinal purposes, the forest ecosystem and the relationship between culture and plant life; the "Blue Route" examines the wetland ecosystem, and the benefits of the species living in the ecosystem provide for human

life.

The routes and explanations are formulated depending on the age group involved. Materials are available for children aged 5 – 8 (kindergarten and lower elementary school), 9 - 12 (upper elementary school), 13 – 15 (junior school), and 16 – 18 (senior high school) and adults. The material and methods for this program have been compile with the assistance of educational and environmental experts (including school teachers). During tracking of the route, facilitator provide nature game and small research for participants.

b. Formulation the Manual Book for Facilitator

The Manual book for facilitator consists the scenario of routes and its explanation; information of methodology and material for facilitator to explain and describe the interpretation objects in each route to the target group during the guiding activities.

c. Providing Supporting Material

Supporting materials functions as tools in implementing program. It consists of evaluation sheet, booklet which used as teaching aid for participants in following program which contains of program material covering objects along the routes); playing card (contain picture or sketch of fauna and flora which can be used for playing game); and demo card (demo card contain of picture or sketch that could help in explaining material program to target group which to be hard to find in the field, such as chain food, process of frog metamorphose, butterfly metamorphose etc.).

Supporting material for the program also consist of magnifying glasses, binoculars, paper pH, color pencils, etc.

d. Recruitment and Training Facilitator

Recruitment facilitator is conducted to get the qualified candidates of REPLING facilitator. Every year, especial for REPLING in Bogor Botanic Garden, we open announcement to public to apply as facilitator. The facilitator play the important role of this program, in order to get an appropriate facilitator, selection through interview of applicant and training are conducted.

Since 1994, the number of applicants who apply to become a facilitator are increasing every year. In table 1., it shows the progress of the applicants number of facilitator and number of facilitator who were trained.

Table 1. Number of Facilitator in REPLING of Bogor Botanic Garden

	Item	Period I (April'94 – Sept'94	Period II (Jan'95 – Jan'96)	Period III (March'97-March'98)	Period IV (May'98-July'99)
1	Number of application	80	205	225	553
2	Number of applicant who were	32	48	47	60

	selected				
3	Number of facilitator in last year facilitator who still join in the next year training	-	13	22	25
4	Number of facilitator who are trained	32	51	69	85

The Facilitator candidate come from various education backgrounds and also consists of students university, wife house hold , employer, and teacher. The statue of the facilitators are volunteer of RMI. Figure1.It shows the various education of facilitator in period 1998.

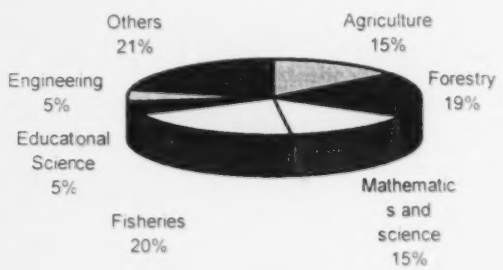

Figure 1. Education Backgrounds of Facilitators

In other conservation area such us natural reserve, we involve local communities surrounding the conservation area, especial young generation to become facilitator, and also the staff of government, such as staff of botanic garden, staff of Department of Forestry. Table 2 it shows the number of facilitator in other conservation area.

Table 2. Number of facilitator who were trained in other conservation area

	Item	Number of facilitator	Note
	Eka Karya Botanic Garden	15	All staff Eka Karya Botanic Garden
	Yan Lappa Nature Reserve	16	Local community and staff of
	Cibodas Botanic Garden	17	Staff of Cibodas Botanic Garden and local community

The training facilitator is aimed to provide basic knowledge of ecology, biodiversity and environmental faced problem, REPLING's concepts, psychology and communication to children and teenager, Guiding Interpretation and Nature Game. The methodology of the training consists of presentation, discussion, simulation, playing in nature and try out with the target group. The training is conducted in 4 – 5 days training and continued with the periodical monthly meeting and discussion to be

aimed to increase the knowledge and capability of facilitators. As resource person in this training, we invite the NGO's activits who already in charge in Environmental Education; academies (lectures).

e. Program Socialization and Promotion

Program socialization and promotion is aimed to disseminate the REPLING program to public, especial to school as one alternative environmental education program which have purpose to foster and increase public awareness on environment and conservation biodiversity. Through this activity, it is hoped that the program would be more recognize as one kind alternative environmental education are applied as extra curricula or local curricula.
The promotion and socialization are implemented through cooperation with Bogor region Office of Education and Culture Department; developed and distributed leaflet of the program; school visiting; meeting presentation; mass media publication, meeting with teacher in each region.

D. IMPLEMENTATION OF REPLING PROGRAM

Participants who interest in this program can contact RMI to register and they have to fill the registration form which is consisted number of participants, date and time. It is to organize the implementation in the field easier.

Participants will be divided into groups which is consisted of 8 – 10 persons which will be facilitated by one facilitator. Facilitator will create a relaxed atmosphere for learning and do observation, nature game activities. Each group can choose one of alternative route for one time guiding interpretation in the 2 or 3 hours.

Since 1994, the number of participants who have been involved in REPLING program, especial in Bogor Botanic Garden become increasing. Table 3. It shows the number of participants of REPLING in Bogor Botanic Garden. The participants come from Java, especial in Jakarta and Bogor, and Bali island too.

In period IV (May 1998 – July 1999), the participants was decreased due to political and economical situation in Indonesia which influent to the school program too.

Table 3. The Number of Participants of REPLING in Bogor Botanic Garden.

	Category of Participants	Period I (April'94 – Sept'94	Period II (Jan'95 – Jan'96)	Period III (March'97-March'98)	Period IV (May'98-July'99)
1	Kindergarten School (5 – 8 years)	153	149	771	216
2	Primary School (9 – 12 years)	120	481	1486	333
3	Junior High School (13– 16 years)	227	879	2721	1004
4	Senior High School (up 17 years)	128	164	1234	750
5	Public	200	214	1154	32
	Total	828	1887	7366	2335

Based on our experience, the school who already involve this program they become this program as extra curricula and some of teachers have been used the

program to integrate in the Biology lesson. Every year they take their students to this program.

E. EVALUATION

There are evaluation form which have to be filled by participants, facilitators, and teacher. The evaluation form is aimed to find out how far the substances could be understood by participants; what are the constrains in the field and whether the methodology and substance are appropriated or no. For the teacher, they could give some comments in the end of the implementation program.

The result of the evaluation form are used by RMI to improve the program.

For example, The result analysis of the evaluation form of the REPLING program in Bogor Botanic Garden in Period III relating with their understanding of presented subjects, there are some conclusions below:

a. Target Group of Aged 5 - 12

Most of the presented subjects can be understood well by participants. It was showed that about 80% of participants in this target group were able to answer correctly the questions in the evaluation form. Some the most interesting subjects, which was discussed during the guiding activity, are described below:

- *The Indonesian flora, including its diversity, its way of life and adaptation, and its benefit for other organisms and environment.*
- *The Indonesian fauna, including its behavior and its benefit for plant. The most interesting observed object is flying fox (fruit-bat) due to its important function in pollinating some fruit trees, for instance durian tree (Durio Zibenthinus).*
- *The pollution, particularly the pollution from solid trash/waste.*

b. Target Group of Aged 13 - 16

About 37% of the whole participants were from students of junior high school. The successful of program socialization on this target group was in connection with the junior high school's curriculum in environmental education field. These schools gave very good response to the REPLING Program. Most of the schools made use of REPLING Program's subjects as strengthening of the junior high school's curriculum subjects in biology, geography and history.

In order to get the student's comprehensively understanding and awareness of environment subject and its problems as well as its solutions, cooperation with the schools has to be improved and empowered.

c. Target Group of Aged Above 17

About 73% of participants in this target group have had experience in environmental field and understood about how important the environment for men and other organisms. The subjects and interpreted objects were deeply discussed among facilitator and participants. After participating in the REPLING Program, most of the participants asked about the possibility of establishment of RMI's "umbrella organization" to facilitate many kinds of environmental activities for the REPLING Program's alumna.

F. FOLLOW UP

Environmental education is a process to create individual and collective level to get involved in problem solving, decision and action formulation and it is to need the time. For REPLING program, we have been realized that participants could not change through just following REPLING in one time in order to continue the process to create them get involved in their environmental problems and conservation biodiversity, RMI has been developed some other program such as to publish environmental bulletin for alumna of REPLING program. This bulletin motivates past participants towards environmental activities. For teachers or parents, it is hoped that this bulletin will become a source of information in terms of continuing environmental education.

REPLING participants are also encouraged to keep up with environmental radio program known SIKLUS. The program is
RMI is also developing the other program called Kampung PENDING (Environmental Education Village) which is to provide appropriate site for alumni of REPLING program to broaden their knowledge, to keep their awareness and to increase their interest on environmental issues

We are also developing environmental education with local community surrounding conservation area. This program are focussing to develop and strengthen capability and local knowledge, especial traditional knowledge to manage natural resources. Program consists of developing tools including comic and poster which will be made by children at their area, and also training of traditional natural resources management for children and teenager. The children who life in conservation area are hoped to become a leader of biodiversity conservation in their area and also become facilitator for their friend from urban area who will come to their village.

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The Coasts and Marine Schools Project
A Professional Development Training Program for Teachers

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ABSTRACT

The oceans, seas and coasts that make up the global marine environment represent the largest continuum on the surface of the planet. Despite the fact that water cover more than two thirds of the planets surface the marine environment struggles to find a place in school curricula because of a perceived lack of knowledge or skills by teachers in dealing with marine issues in the classroom, or a lack of suitable resources. This paper considers the role of education in conservation and marine environment management and provides an overview of a successful Australian capacity building program for teachers to engage in marine education programs, the Coasts and Marine Schools Project.

1. A Rationale for Marine Environmental Education

"We still know more about the surface of our moon and Mars than we do about what lies beneath the surface of the sea. There may be life elsewhere, but there is no other place we know of with a sea of life, no other place with a built in life support system. For ages it has taken care of us. The time has now clearly come for us to take care of the sea."

Sylvia A. Earle, Marine Biologist and Undersea Explorer

The State of the Marine Environment

For many of the nations that have representatives attending this conference, from Asia and Beyond, the marine and coastal environment is the core of existence in the lives of their people. Marine and Coastal environmental issues in the Asia / Pacific region challenge both the existence of traditional and modern lifestyles as well as the integrity of natural ecosystems of the sea and ocean to continue to provide what we depend upon. Environmental integrity of the oceans and seas is critical if we are to achieve conservation of biodiversity and sustainable use of the marine environment.

Coastal and marine ecosystems and resources provide food, minerals, pharmaceuticals, construction materials and a vast range of other products used by

people. They also support fisheries and the growing tourism and recreation industries and play a vital role in transport, and in the culture and lifestyle of coastal communities. (Zann L.1995, p.96)

In addition their significance to humanity as a resource, the seas and oceans form a major part of a system that cover more than 70% of the surface of our planet. They contain the greatest diversity of groups of animals found anywhere. The oceans are vital to the existence of life on the planet and play a major role in determining our climate and weather patterns.

The marine environment is critical to the natural and cultural heritage of the world. Many marine areas support the life cycles of a great diversity of plants and animals and the oceans are an essential part of climatic cycles and other global processes (Biolinks, 1996, p. 12)

The Secretary General of the UN (United Nations 1998) in his Report to the General Assembly on Oceans And The Law Of The Sea highlighted the importance of environmental protection for the sea not only for conservation, but also for development. "*The greatest impact of the Convention on the Law of the Sea on the international agenda thus far has perhaps been its contribution to raising awareness of the fundamental importance of the oceans to the overall well-being of the planet. While the protection and the preservation of the marine environment should invariably remain a primary objective of the international community, States should not overlook the significance of ocean resources to overall development and economic growth. In other words, the international community must ensure that the resources of the seas are utilized and managed in a sustainable, environmentally sound manner in order to support and feed a growing world population.*"

The challenges to sustainable use of the sea are the issues that arise as a result of the interaction between humans and the sea. For the Asia / Pacific region the major marine issues include

- declining water quality due to pollution by sewage, chemicals, and nutrients
- loss of habitat - particularly coastal habitat such as mangroves, seagrasses, and inshore reefs
- loss of biodiversity – as a consequence of habitat loss or change
- declining fish stocks due to unsustainable fishing practises
- increasing sea levels associated with global warming
- unplanned development of the coast
- invasion by exotic species

These issues challenge the integrity of marine natural systems and their ability to continue to support human populations and their needs for resources.

DOWN UNDER BLUES

"Australia, you are a million times blessed, with some of the most unique and spectacular coasts and seas in the world. You still have the chance to save and sustainably manage these areas, but due to loss of habitat, pollution and overfishing, time is rapidly running out".

Professor David Bellamy OBE

Australia is often perceived by people from other countries as being a clean and green country with a small population, large areas of land, and few environmental problems.

Australian marine environments stretch from the tropics to Antarctica with more than 60,000 kilometres of coastline, one of the longest coastlines of any country. Our coasts and seas have evolved in isolation from many other parts of the world and, due to the low rainfall, contain low levels of nutrients. As a consequence Australia's waters contain some of the greatest diversity of marine life on the planet and many of the animals and plants found here are found nowhere else.

Despite our relatively pristine seas, there are many warning signs that environmental degradation of the marine environment is beginning to show. As is the case in most countries around the world, declining marine and coastal water quality is regarded as one of the most serious issues affecting our marine and coastal environments. Each year, millions of tonnes of sewage effluent are discharged into estuarine and coastal waters. Pollution from industry and agriculture pour nutrients and other chemicals into the sea. Fishing catches are declining as a result of declining environmental quality and overfishing. Plastic pollution creates unsightly litter problems as well as entanglement and ingestion by marine life.

While the issues facing Australia's marine and coastal environment are similar to those identified as being of global concern, many of the problems facing the marine environment in Asia and the region are far more pressing in terms of a need for action to reverse the rapid decline in marine environmental quality.

Back in 1992 the United Nations Conference on Environment and Development (UNCED) in Rio was convened because of widespread concerns about the degradation of the environment and the loss of global biodiversity. With respect to the ocean, UNCED recommended that all nations:

- prevent, reduce, and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities
- develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic, and development needs
- promote the integrated management and sustainable development of coastal areas and the marine environment

The UNCED recognised new strategies in marine environmental management were required that can overcome geo-political and interdisciplinary divisions. These strategies should also be based on principles of ecology and of ecologically sustainable development. A critical part of this process is the development of environmental education programs that not only address issues on land but also those of the sea.

The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) meeting in 1998 observed *that despite some localised successes, degradation of the oceans continues on a global scale. Among the successes are the concerted action at the national and international levels to reduce the quantities of oil discharged from ships and the convincing evidence that in certain areas better management of land-based activities has led to cleaner beaches and bathing water, as well as seafood safer to eat. On the other hand, persistent problems continue in the form of pollution by sewage, chemical and nutrients, unrestrained coastal development and over-exploitation of marine living resources and the destruction of other resources such as mangroves and coastal forests.*

In GESAMP's view, *implementation of sound, sustainable management of oceans and coasts remains the exception rather than the rule. The reasons are threefold.*

- *First critical scientific information is lacking, or if it is available it is poorly communicated and seldom used.*
- *Secondly a more common barrier comes from governance issues. As pointed out in the report, successful coastal management requires integrated, collaborative action by national and regional agencies as well as the participation of industry and the general public.*
- *Finally, GESAMP notes that even where the nature of certain ocean environmental problems is understood, the knowledge to solve them is available and the necessary management tools may exist, there is in many instances a lack of determination and political will to act.*

(Source: United Nation, Report of Secretary General, 1998)

At the close of the 20th century it is timely and imperative that we as a group of environmental educators take heed of the challenges facing the greatest global ecosystem, the oceans, and consider how much or how little has been achieved in improving our relationship with the ocean since 1992.

2. Environmental Education for the Sea

The United Nation's Agenda 21, developed at the Earth Summit in 1992, gives education an important role in promoting sustainability of all environments :

"Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues ... It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation

in decision-making." (Source: UNCED 1992)

In order to better value, understand, and manage our marine and coastal environments it is essential that environmental education programs for schools and the broader community include programs that directly address marine and coastal issues. The development of quality environmental education programs that address marine and coastal issues, implemented as part of broad reaching school curricula, provides a crucial element of an effective long-term strategy for sustainable use and conservation of the sea.

In the State of the Marine Environment Report for Australia these principles were highlighted." *The sustainability of coastal and marine systems depends on Australians*

- *knowing about the marine environment,*
- *recognising the threats to it,*
- *wanting to care for it, and*
- *learning the skills to look after it.*

Therefore, coastal and marine studies are also vital for achieving the environmental awareness, values attitudes, and skills consistent with ecologically sustainable development." (Zann, 1995)

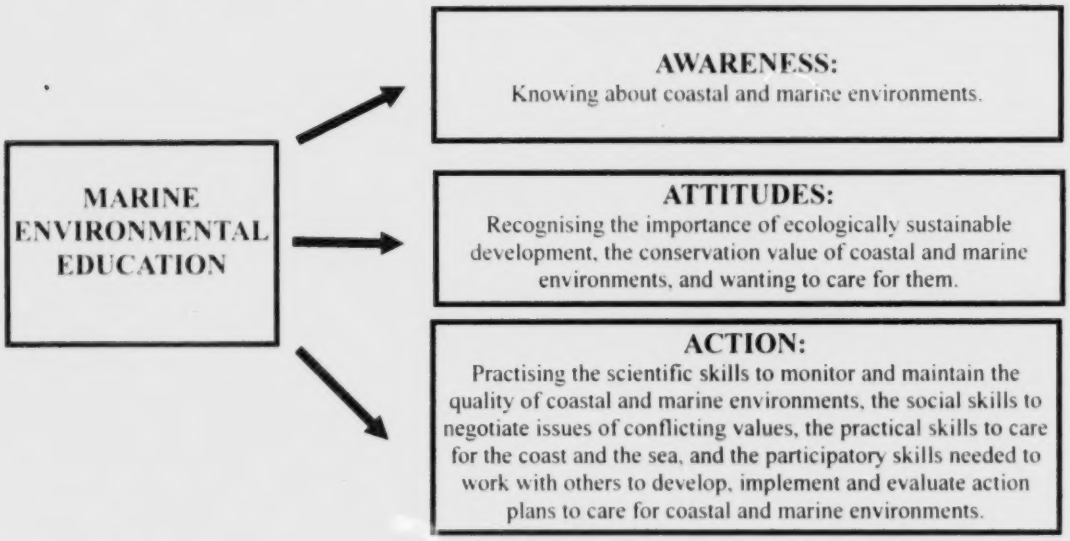
The real challenge for Environmental Education in Asia and Beyond for the marine and coastal environment is to be able to provide effective strategies for addressing conservation and sustainability issues in the context of human needs.

The Coasts and Marine Schools Project from Australia provides some directions for how Environmental Education for the Coastal and Marine Environment can be incorporated into the professional development of teachers. It is through the improved capacity of teachers to deliver marine environmental education programs that students will be able to engage in programs that deliver the 3 A's for marine and coastal environmental education:

- increasing **awareness** of the sea and the issues affecting the marine environment
- developing **attitudes** that encourage valuing of sustainable development, conservation, and caring for the sea
- practicing skills needed to take **action** to protect and sustainably use the marine and coastal environment

The ultimate goal of coastal and marine environmental education is to assist in maintaining biodiversity and ecologically sustainable development. The alternatives are continuing environmental degradation and ecological collapse.

Figure 1. The Three A's of Coastal and Marine Studies
(Source: Fien J.1997)


MARINE ENVIRONMENTAL EDUCATION
AWARENESS:
Knowing about coastal and marine environments.
ATTITUDES:
Recognising the importance of ecologically sustainable development, the conservation value of coastal and marine environments, and wanting to care for them.
ACTION:
Practising the scientific skills to monitor and maintain the quality of coastal and marine environments, the social skills to negotiate issues of conflicting values, the practical skills to care for the coast and the sea, and the participatory skills needed to work with others to develop, implement and evaluate action plans to care for coastal and marine environments.

Marine Education In Australia

Most environmental management programs identify education as one of the most important and cost effective management tools. Managing Australia's marine environment is no exception. Effective management depends on Australians knowing about the marine environment and its importance, recognising the threats to it, wanting to care for it, and learning to look after it.

Many factors influence people's values (family, friends, media and personal experience) but it is education at schools, colleges and universities that gives people most of the formal knowledge and skills to make informed decisions, and the ability to act on them. Education also provides training for the scientists, engineers, planners, educators and other professionals and technicians needed to manage our marine environment.

Marine Education in Schools : Australia has around three million school students, 10,000 schools and 200,000 full-time school teachers. During their formal education every Australian student learns something about the sea in a variety of subjects, from art to zoology.

Education departments in each State and Territory develop school curricula, but details of content are at the discretion of individual schools and teachers. In recent years, an interdisciplinary approach to curricula and the growing community concern about the environment has led to an increase in environmental topics in general subjects such as science and geography. However, topics are generally biased towards the terrestrial environment.

Several Australian States have developed specialist marine education subjects at upper secondary level (Years 11 and 12). These combine practical marine skills such as sailing and diving with marine environment education. While comprehensive marine education programs do exist, the quantity and quality of marine education in most schools remains very limited. In some States specialist coastal field centres, such as the Marine Discovery Centre in Queenscliff, have made a major contribution to providing access to quality marine education experiences. Despite this most Australians leave school with little more than a basic understanding of the sea, and the important issues affecting the marine environment.

Marine environmental education not only occurs formally in schools and universities but also informally in the community for people of all ages and walks of life. Particular attention is now being given to marine education of user groups, decision makers, indigenous communities, non-English speaking Australians and other special groups. However, while some excellent examples of community marine education programs exist, most Australians are reached superficially, if at all.

MARINE EDUCATION CENTRES

One of the greatest assets for the education community in Australia dealing with marine and coastal issues has been the establishment over the last decade of specialist field study centres that focus exclusively on marine environments. A good example of this is my work location, the **Marine Discovery Centre in Queenscliff , Victoria**, a interpretive field study centre attached to the **Marine and Freshwater Resources Institute (MAFRI)**, a prestigious Victorian aquatic research and training organisation, part of the Department of Natural Resources and Environment.

The mission statement for the Marine Discovery Centre is:

"To promote conservation by increasing awareness and understanding of the marine environment."

All programs conducted by the Marine Discovery Centre for schools and other groups have this philosophy underpinning their content and outcomes.

For schools, a Schools Program has been developed which complements curriculum requirements of the education department and the need for students to meet specific learning outcomes. A broad reaching program of "hands-on" interactive activities provide opportunities for students to participate in activities that are engaging and enjoyable as well as meeting specific learning outcomes for school curricula. Examples of programs conducted include rock pool studies, mudflat investigations, snorkelling and canoeing, beach activities, or trips to sample life in the bay, as well an indoors interactive classroom based program. Programs are conducted by qualified and experienced teaching staff who have backgrounds in marine biology, science, environmental education and outdoor education.

In addition to programs for school students, the Marine Discovery Centre has provided a focus for Professional Development opportunities for teachers in Victoria and other parts of Australia in marine education for the last decade. An extensive offering of programs for teachers from pre-schools, primary, secondary, and tertiary institutions provides specialist knowledge on marine life, marine and coastal environments, and strategies for teaching using the sea. Skills gained in the Marine Discovery Centre can then be applied to the teacher's own environments. Recently MAFRI provided the venue for the second "Train the Trainer" workshop from the Coasts and Marine Schools Project attended by trainers from all around Australia, each of whom was able to take home new knowledge, skills and strategies for delivery of marine environmental education.

A further role that a specialist Marine Education Centre provides is in opportunities for training and development of specialist marine educators. Many of the staff that have worked at the Marine Discovery Centre are now in locations around Australia and overseas. Indeed, staff from the Marine Discovery Centre have conducted and participated in training programs here in Korea on two occasions.

MAFRI's Marine Discovery Centre, Queenscliff, has been pivotal to the development of a growing culture of education in marine resource management and has provided an excellent model for the development of similar centres in many other states and regions of Australia. Based on the highly successful operation of the Marine Discovery Centre at Queenscliff, Environment Australia (the national government's environmental ministry) is currently considering proposals for funding the establishment of similar centres in different parts of Australia.

Barriers to Effective Marine Education Programs in Schools

While their are a large number of excellent resources available to assist in the implementation of marine education programs many teachers still feel a lack of confidence in both teaching strategies and knowledge for teaching about the marine environment.

In order to understand why teachers were unwilling to include marine education in their programs, an investigation of the barriers presented to teachers was undertaken Some of the key reasons identified through the Coasts and Marine Schools Project Stage 1 for the lack of effective marine education programs integrated in school curricula are:

- the community's greater familiarity with terrestrial issues
- a lack of training opportunities for teachers in marine subjects
- the scarcity of teaching materials on the marine environment
- the logistical difficulties and the cost of marine excursions

The Coasts and Marine Schools Project in Australia (Stages 2 and 3) was developed in order to overcome these barriers. In particular the Coasts and Marine Schools Project seeks to provide a comprehensive capacity building program for

teachers improving access to resources and professional development, to increase the implementation of marine and coastal environmental education programs within schools.

3. The Coasts and Marine Schools Project

The focus for this paper, the Coasts and Marine Schools Project is a part of a long-term national coastal and marine education programme that has been introduced to help develop:

- an awareness, appreciation and understanding of the marine environment and of the need for its conservation
- environmentally responsible attitudes
- a commitment to work for a change that would promote the conservation of the coastal and marine environment
- a wide range of skills for successfully tackling coastal environmental problems
- the ability to actively contribute to planning and management processes
- a high level of commitment to future management programs

The Coastal and Marine Schools Project is part of an Australian Government Coastal and Marine Program designed to inform all Australians on how we can work together to safeguard our coasts and marine environment for the future. Funding for the Project was provided through the Australian Government's Department for the Environment, Environment Australia.

The Australian Government recognises the significance of marine education in developing community stewardship for the marine environment and has made clear statements regarding the importance of improving resources for teaching about the sea in the development of Australia's Oceans Policy (Commonwealth of Australia 1998). The main points raised in the policy with regard to schools education include:

- a commitment by the Government to developing a long term marine education policy and program for incorporating in curricula for kindergarten to Year 12 in all States and Territories
- an undertaking to continue to develop relevant resource material
- a commitment to further supporting provision of practical educational material for teachers and students

The Coastal and Marine Schools Project was originally an initiative of the Department of the Environment, Sport and Territories Portfolio Marine Group (now part of Environment Australia) and the **Marine Education Society of Australasia** (MESA) and developed in order to assist in improving the capacity of teachers to deliver quality marine education programs in Australian schools. The project aims to extend and develop a curriculum and professional development programme for teachers that promotes and encourages coast and marine studies from Kindergarten to Year 12 and incorporates currently available teaching materials and resources.

The Project itself has been carried out in three stages as a consultancy by three groups in consortium: these were the Marine Education Society of Australasia (MESA), the Australian Association for Environmental Education (AAEE) and the School of Education at Macquarie University through Macquarie Research Limited.

Figure 2: The Coasts and Marine Schools Project - An Overview

Australian Government
Coastal and Marine Program

Project Undertaken by Marine Education Society of Australasia (MESA)
Australian Association for Environmental Education (AAEE),
Macquarie University and Griffith University

Stage 1: 1996 - 97
Resource Inventory and Publishing
Teacher Surveys
Identification of Best Practice of Coastal and Marine Studies in Schools

Stage 2: 1997 – 98
Development of 10 modules for *Coastal and Marine Studies in Australia - a Workshop Manual for Teachers*
Initial Train the Trainer Workshops
Teacher Training Workshops in States and Regions

Stage 3: 1998 – 99
Review of Stages 1 and 2
5 new Modules for Coastal and Marine Studies in Australia completed
2nd Train the Trainer Workshop
Posting of Modules on the WWW / CD Rom
Coast and Marine Teacher Workshops conducted in all States

Stage 1: Resource Inventory : the major aim of Stage 1 was to prepare an up-to-date list of relevant and useful resources and assess the status of coastal and marine education in Australia. This consisted of four parts, the results of which were published as a report (Department of Environment, Sports, and Territories 1996).

Part 1 involved the preparation of a national resource list which included an evaluation of each resource, where it could be used in the curriculum, and what level of

students the resource would be appropriate for. In addition to being a valuable resource itself, the listing highlighted the types of resources currently unavailable, indicated what type of resources are most frequently used by teachers and those resources which are available and not used by teachers. The results of this provide valuable direction for the future development of resources for coastal and marine education.

The establishment of an on-line Marine and Coastal Education Database, that includes search functions, provides teachers with access to over 700 useful resources for teaching about the marine environment.

Parts 2, 3 and 4 involved surveying the status of coastal and marine education in each State and Territory education system, identifying examples and case studies of 'Best Practice' in approaches to coastal and marine studies and developing 'pointers' that link current resources and programmes to the nationally-developed curriculum profiles.

Results from this stage identified that the majority of coastal and marine education is presently being taught in the curriculum areas of Science and Studies of Society and Environment and, to a much lesser extent, in Technology and Health. All stakeholders contacted for their opinion stated that they would like to see a further emphasis of coastal and marine education in all areas of the curriculum from Kindergarten to Year 12 and in pre-service teacher education, i.e. in programs for teachers in training.

The gaps found, however, included the lack of links between schools and pre-service teacher education programmes. A real need exists to establish partnerships between institutions training teachers and schools so those teachers are trained in coastal and marine studies and in environmental education.

The most common strategies employed by schools with successful programmes had students actively participating in realistic situations were they could see purposeful results from their efforts. The teaching strategies were varied, providing hands-on experiences, field studies and linking activities with the community, marine organisations and universities.

An important outcome of the examination of the curriculum from Kindergarten to Year 12 was that there is ample opportunity for the teaching of coastal and marine topics within existing curricula, although there was a lack of resources for some disciplines in science, eg. physics and for other areas of the curriculum including technology and health, mathematics and English.

Stage 2 : Professional Development Program

The findings of Stage 1 contributed to the professional development programme of Stage 2, the main aims of which were:

- to develop materials for teachers which make them aware of available resources and how to find new resources;

- to highlight features of "best practice" in coastal and marine studies so they can be incorporated into programs
- to bring teachers up-to-date with information and key issues in coastal and marine education; and
- to provide guidelines for incorporating coastal and marine studies into existing programmes.

A training manual, *Coastal and Marine Studies: A Workshop Manual for Teachers* (Fien J. 1997) was developed to provide a flexible set of workshop materials to help achieve these aims in both pre-service and in-service teacher education.

This comprehensive program included a series of modules that could be delivered either independently to particular interest groups, or as a program in which a range of modules can be used by and with teachers to deliver marine education programs across a variety of curriculum areas.

Modules developed in Stage 2 included:

1. The Nature Scope and Purpose of Coastal and Marine Studies
2. Best Practice in Coastal and Marine Studies
3. Cross Curriculum Planning for Coastal and Marine Studies
4. Using the Environment and Community as a Resource for Learning in Coastal and Marine Studies
5. Investigating Coastal and Marine Environments through Science
6. Investigating Coastal and Marine Environments through Studies of Society and Environment
7. Who Care for Our Coast? Understanding How our Coastal Zone is Managed.
8. Accessing and Evaluating Resources for Coastal and Marine Studies
9. Teaching Controversial Issues in Coastal and Marine Studies
10. Appropriate Assessment for Coastal and Marine Studies

These modules were developed as discrete units that could be applied and adapted to a broad range of audiences. A consistent module format was applied, with each module containing an introduction, statement of objectives, workshop activities outline, listing of materials required, overhead transparency masters, copies of readings and a list of further reading references. An important strength of the modules is their flexibility, allowing the skills of individual presenters to be harnessed when providing field experiences and workshop programs.

"Train the Trainer" Program : Another major component of Stage 2 was the "Train the Trainer" Program. A number of key educators in environmental education from different parts of Australia were identified and invited to participate in a training program in the use of the materials published as modules for the Workshop Manual. Selected participants were brought to a central location for a weekend and introduced and trained in the use of the modules. This, considering the large distances involved, was a difficult and expensive task but one which nevertheless provided an opportunity

for participants to engage in the modules and develop some strategies for implementing teacher training workshops in the various regions of Australia. This was a critical part of the implementation of the whole project.

From this initial trained group of educators, delivery of programs for classroom and pre-service (training) teachers in the regions and states of Australia took place.

Stage 3: Further Capacity Building.

As a result of the initial evaluation of Stage 2 of the Project and recommendations from members of the Project Steering Committee, a number of revisions were made to the initial modules. Areas that had not been adequately addressed in Stage 2 were also identified.

From this process, five new modules were established:

1. Marine Education Programs for Early Childhood - strategies for developing a relationship with the sea for 3 - 8 year olds
2. Taking Action for the Marine and Coastal Environment - strategies for schools to get involved in undertaking action based learning to address marine environmental issues
3. The Arts and the Sea - using creative and performing arts to explore the sea
   Multicultural Perspectives of the Coast - developing strategies for understanding migrant perspectives of the coast
4. Indigenous Perspectives of the Coast - developing awareness and respect for indigenous Australians history, knowledge and current perspectives of the coast

An additional national Train the Trainer program was implemented during this stage of the project. Further to this, a series of Teacher Professional Development Workshops were carried out by Trainers from each state. These were conducted in schools and field studies centre throughout Australia. From the initial trained group of trainers, over 700 pre-service and in-service teachers have now participated in programs intended to improve their capacity to deliver marine and coastal components of their own classrooms.

The full effect of this project is yet to be realised as teachers engage in the training programs and them implement change in their own schools. Independent evaluators of the program estimate that over the next 12 - 18 months over 2000 teachers will have been involved in attending workshops or lectures based on the materials produced for the program delivered by of the 'Trainers"

Electronic communication: In order to provide access to the materials developed through this project, electronic media have been used extensively for each stage of the Project. Materials accessible on the Internet for all teachers in Australia (and overseas) include:

- Coastal and Marine Studies in Australia - a Workshop Manual for Teachers

- Coast and Marine Schools Project Stage 1 Report
- Australian Coastal Education Resources Database

The revised modules are expected to be posted on the same site by the time of the conference in late September 1999.

The materials are also being published on CD-ROM to allow frequent users to adapt materials to suit their individual training needs.

By providing the materials in this format, trainers without access to the hard copy versions have been able to access and to use the modules. For participants of this conference, access to the www means that you will be able to view, adapt and use the modules and program from the website in designing programs that are suited to your local needs.

Project Evaluation

As a part of the funding arrangement with Environment Australia the Coastal and Marine Schools Project has been independently evaluated in terms of meeting the outcomes initially established and providing some directions for the development or refinement of this or other programs.

Major Evaluation Points:

1. The Coast and Marine Schools Project has achieved the goal of marine and coastal education capacity building, making a cost-effective and practical contribution to professional development through the provision of a train the trainer program and education modules.
2. That Environment Australia should continue to fund the project to its completion.
3. Achievements include:

- Development of 15 modules (as previously described) and Provision of "Train the Trainer" Programs
- Adaptation of the original modules in different workshop locations to suit the local learning environments and interests and needs of different groups of teachers
- Development of a highly engaging practical professional development program that relies heavily on best practise learning strategies including "hands-on" learning in the field
- Attendance of 700 pre- and in-service teachers at professional development workshops based on the project
- projected attendance at over 2000 at Coasts and Marine Project workshops in the next 12 months
- Use of modules and trainers in a number of teacher training institutes

4. Concerns included:

- Some trainers not actually implementing training programs in their own

regions - this could be overcome by more rigorous selection of suitable Trainers

- Programs developed for trainers need to adequately take into account the skills and interests of the participants. This is particularly significant in considering that the trainees selected to be involved in "Train the Trainer " programs are competent in the delivery of programs to teachers and need opportunities to contribute and share strategies with each other.

5. The effects of the Coasts and Marine Schools Project may take several years before the flow-on effects of increased community stewardship for the marine and coastal environment can be fully realised
6. Overall, that as a consequence of the project 15 modules have been developed as a specific resource to facilitate professional development for teachers and that ongoing and autonomous workshops are continuing to extend the modules to new pre-service and in-service teachers. (Source: Lidstone, J. 1999)

CONCLUSIONS AND RECOMMENDATIONS

In light of the experiences that have been gained through my involvement with the Marine Discovery Centre, as President of MESA, my role as part of the Steering Committee for the Project and as a contributor, writer and workshop presenter in the Coasts and Marine Schools Project, I would like to summarise some of the earlier points raised and make some observations for professional development for teachers in environmental education - with specific reference to the marine environment. I hope these may be of value to other educators and policy makers in considering the major contribution that environmental education programs can make to the future sustainable use, management, and conservation of marine and coastal environments:

- that at global, regional, and at local levels, marine environmental issues are pressing and in need of greater engagement by environmental educators - particularly in the Asian - Pacific region.
- that marine and coastal environmental education provides a practical strategy for governments to implement in order to achieve community stewardship and engagement in sustainable use and conservation of marine and coastal environments
- that the sustainability of coastal and marine systems depends on communities knowing about the marine environment, recognising the threats to it, wanting to care for it, and learning the skills to look after it. Therefore, coastal and marine studies are also vital for achieving the environmental awareness, values attitudes, and skills consistent with ecologically sustainable development
- that teachers require both access to teaching resources and suitably developed training opportunities if they are to implement marine environmental education programs in their own classes. This applies to both teachers that are currently in training as well as those that are already teaching in the classroom.
- that the Coasts and Marine Schools Project provides a good model for other Teacher Professional Development Programs
- that marine and coastal environmental education programs can and should be

integrated into traditional curriculum areas across preschools, primary and secondary schooling, as well as in teacher training

- that sharing teacher training materials through the use of electronic means such as the www provide cost effective means for teachers and trainers to access materials from any location

The responsibility of environmental education is to improve awareness, develop attitudes and take action for the environment. The challenges facing the marine and coastal environment are vast and pressing and require greater engagement by environmental educators if our current problems are to be addressed and the future conservation and sustainable use of the oceans resolved. Developing opportunities for improving the capacity of teachers to deliver quality programs for the marine environment is a critical part of this process.

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United Nations (1998), *Report of the Secretary General on Oceans And The Law Of The Sea* to the United Nations General Assembly (A/53/456) Fifty-third session, Agenda item 38 (a)

Zann L.(1995), *Our Sea, Our Future: Major Findings of the State of the Marine Environment Report for Australia*, Department of the Environment, Sport and Territories, Canberra

Useful Websites:

- Coastal and Marine Studies in Australia - a Workshop Manual for Teachers
http://www.environment.gov.au/education/aeen/pd/cms/introduction/homepage.html
- Marine Education Society of Australasia
http://www.mesa.edu.au
- Marine and Freshwater Resources Institute
http://www.nre.vic.gov.au/mafri/
- Marine Discovery Centre, Queenscliff
http://www.vicnet.net.au/~vims
- Environment Australia
http://www.ea.gov.au
- Coast and Marine Schools Project Stage 1 Report
http://www.environment.gov.au/portfolio/dest/coast_marine/cerd/contents.html
- Australian Coastal Education Resources Database
http://www.environment.gov.au/net/cerd.html
- Australian Association for Environmental Education (AAEE)
http://www.education.uts.edu.au/projects/AAEE/index.html

International Workshop on Environmental Education
in Asia And Beyond
October 11-15, 1999

Environmental Education for Visitors in Korean National Parks

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ABSTRACT

The first nature trail in the country was established within Naejangsan National Park in 1992, in which forest ecosystem was the main focus. Since the long-term strategies and tactics for the conservation of national parks have been established in mid-1990s, nature trails have been established in various national parks including Chiaksan, Chrisan, Soraksan, Tadohae, Woraksan, Kayasan, Sobaeksan, Pukansan. Further improvements should be made within such fields as preliminary natural ecological survey, lacks of professional designers for the facilities and master plan, lacks of interpreter and interpretation within nature trails.

Visitor centers and interpreter guided-tours are also introduced within several parks. A so-called "The National Park Ecology-Culture Center" is being formulated in the National Park Authority in order to invigorate environmental education for years to come.

INTRODUCTION

The 21st century is so-called a century of environment, in which the richness of biodiversity, the degree of environmental protection and the techniques of recovery in damaged areas have become indices of international competitiveness. Therefore, a long-term strategy for the protection of the national parks, the core areas of ecosystem, is necessary. In order to accomplish this goal, the recovery of damaged areas and enhancement of the public's spirit of nature conservation are the most important tasks. Sustainable use of nature should be in public's mind to conserve the nature. Therefore national parks should be the focal point for the environmental education. Environmental education is the indirect way of nature conservation by the enhancement of conservation mind, which has become an ultimate solution for the environmental problems. Two main environmental education facilities in national parks are the visitor center and nature trail. The former becomes a center for information dissemination and visitor management. The latter gives a chance to experience the nature.

VISITOR CENTER

When we discuss the environmental education in national parks, the first thing we can think about is the visitor center. In terms of visitor center, Korean national parks lie in very poor conditions. Since each national park has numerous entrance point and visitors to the parks make their trip during a specific period of time (e.g., hot summer for the cool water and autumn for the maple tree season). Construction of a building itself is nothing compared to the software such as display program and education for the interpreter. Even though National Parks Authority has just finished natural resources survey for each park, we don't have enough flora and fauna samples to display. In fact, we are still very far from a full understanding of the ecosystem.

There were two visitor centers out of 20 national parks, one in Chirisan National Park, the other is in Chuwangsan National Park. Compared to the well-established visitor centers in North America, both display items and guidance are in poor conditions. The ratio of visitors to the center is very low compared to total number of visitors and their expectation for the environmental education is also very low.

The most recent visitor center was opened in Naejangsan National Park in 1998. A total design concept has been employed, which includes the following steps from the site selection – construction design – display program – interpreter education. The National Parks Authority is planning to install visitor centers in each park using a same scheme.

Personally I believe that residence buildings and other relics remaining in national park territory can be used as a folk village and environmental education facilities for both foreigners and young generations, who have not experienced traditional culture.

NATURE TRAIL

The first nature trail in the country was established within Naejangsan National Park in 1992, in which forest ecosystem was the main focus. Since the long-term strategies and tactics for the conservation of national parks have been established in mid-1990s, nature trails have been established in various national parks including Chiaksan, Chrisan, Soraksan, Tadohae, Wolaksan, Kayasan, Sobaeksan, Pukansan.

Nature trails are usually located where the visitors are concentrated for a season or year-round, and ease of visit guaranteed. However, since most of trails are located along the valley, the courses have disadvantage of going and coming in a single trail. Also, many of trails are using former tracking courses, environmental conditions are not satisfactory due to the damages incurred by the visitors.

Since nature trails in national parks of Korea are still introductory stage, basic tactics such as the design of courses, construction methods, management skills needs further improvements. Also, 'Natural Parks Act' doesn't have any solid definition of nature trails, it invokes the definition of tracking course instead, which in turn hinders the development of nature trails.

INTERPRETIVE SIGNS AND GUIDED TOUR

If visitor centers and nature trails are for the whole park areas, interpretive signs are rather for the foal points, such as a old-tree or a peculiar landform, etc. A sign that explains a talus in Wolchulsan National Park is a good example of interpretive signing. National Parks Authority has hung labels for trees within major hiking trail in most national parks.

The most efficient form of environmental education is the interpreter-guided nature observation. Self-guided nature observation is practiced within most of nature trails with the exception of Tadohae Marine National Park, in which interpreter guided-tour has been tried for years. The reasons for the slow progress are as follows; firstly national parks authority does not have enough men-power with adequate education and secondly, both visitors and government do not show much interests for the nature trails yet.

Local environmental NGO groups could be a feasible solution for the shortage of experts. While visitor centers provide a general view of the park via VTR and/or slide shows, expert guides could show a small group of interested people cultural, ecological and historical features along a nature trail. Guides could invoke a curiosity and interests by the two-way communication, which could maximize the education impacts. For this purpose, guides should possess both ecological background and sense and humor to answer the impromptu questionnaires from the group.

THE NATIONAL PARK ECOLOGY-CULTURE CENTER

The NPA is developing a concept of so-called "The National Park Ecology-Culture Center" to enhance the environmental education within national park system. It is composed of three stages. Each stage has its own targets and procedures that are summarized in a table below.

Stage	Year	Targets	Remarks
1st stage	1999-2000	Pukansan National Park	• Opening of the Center, Publication of manuals • Training for the interpreter and demonstration for the elementary school kids • Internet site opening
2nd stage	20001-2003	Model Parks	• Manuals for each type of parks and target audiences

			• Opening of marine park center • Construction of international network of environmental educators • Training for the employees of the National Parks Authority
3rd stage	2004-2005	Whole Parks	• Construction of nation-wide information system for the environmental education facilities and groups • Training for the all employees of the NPA • Publication of CD-ROM manuals

CONCLUSION

More than thirty years have passed since the designation of the first national park in mountain Chirisan, and also twelve years have passed since the establishment of National Parks Authority. Since National Parks Authority regards the conservation of nature as the most important goal, we are taking conservation measures to protect ecological resources and environmental education to enhance the public's conservation mind.

Korean national parks introduced the concept and design of nature trail to Korea and have become a pioneer in the development of nature trails. Therefore, when provincial and urban recreational parks want to introduce the environmental education programs within each park system, nature trails in national parks can acts as a model. Further improvements should be made within such fields as preliminary natural ecological survey, lacks of professional designers for the facilities and master plan, lacks of interpreter and interpretation within nature trails.

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Ecological Education and Public Awareness

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ABSTRACT

One of the main areas in decision-making to be supported by the state system of ecological education and environmental public awareness is the supervision and enforcement of compliance with environmental regulations. The supervision is carried out by federal and local authorities, as well as, by the Ministry of Nature and the Environment, Ministry of the Education. The ultimate goal is a gradual improvement of the state of the environment, while practical aims may be the termination of dangerous operations or the collection of fines to finance specialized funds.

Ecological education and environmental public awareness are important components of any viable strategy to improve environmental information and to confront issues, such as deforestation, desertification, loss of biodiversity, and air and water pollution. Increasingly, countries have the need to tailor ecological education for all levels. Curricula in primary and secondary schools and in the nonformal sector help building citizen awareness of environmental concerns and reinforcing community support for conservation and environmental protection.

1. ECOLOGICAL EDUCATION

Task has rised to formulate, on the national level, a scraggy for the ecologically sound development of the economy in conformity with the universal trends of the sustainable development of the XXI Century through ensuring orderly balanced social development in all spheres of the social life through the appropriate government policy.

The level of the ecological education of the population will be enhanced with the creation of a new system of education, environment and health consonant with the universal trends of the sustainable development of the world and the new social economic relations of the country.

Problems, such as, limited teaching resources, inadequate training and methods which are inherited from the past, often have little connection to environmental issues which today need to be addressed. By identifying problems, such as, poaching of rare species like Snow Leopard or Saiga antelope, children can develop an understanding of real problems and can convey their concern to their parents.

Summer children's camps provide an excellent opportunity to expand the ecological curricula. Environmental games and camping trips allowing the children to experience nature are popular summer activities. Instructional environmental games to identifining rare species and building a sensitivity to nature may have a minimal impact on specific environmental problems. These activities, However,can provide an appreciation of nature that can last a lifetime.

Environmental education forms a basis for the literate environmentaly aware user community. General environmental programs are being introduced at all levels of education, including pre-school /kindergarten/, primary and high schools, as well as technical colleges, and institutions. The theory and methodology of environmental education are carried out by dealt with at 3 institutions under about 10 sub-programs within the program "Ecological Safety of Mongolia". The NGO of Environmental Education and the Inter-level co-ordination mechanism, and sub-national centers of environmental education have been locally established in Khovd, Darhan-Uul aimag, and Kharhorin.

A number of secondary-/high- school institutions have introduced special environmental courses, e.g. Health and the Environment, Man and the Biosphere, Basic Ecology, Human Ecology, Nature and Culture. Environmental problems are also being taught in the context of international school projects. A considerable environmental component is present in high-school courses in Biology and Geography.

A separate compulsory course in Ecology has recently been introduced in school curricula. Local and national Olympiads (contests) in Biology and Geography for school students have been arranged for years, and a national Olympiad on the Environment has been held since 1997. Environmental projects and camps are held in many parts of the country, including the All Mongolian Summer School on Ornithology, Geo-Botany and Aquatic Ecology, held on the Khovsgol nuur and other places, since 1980. A national competition for school students on Water the Earth was held in 1997 on Ulaanbaatar.

Institutes of higher education also need research and teaching and training materials related to environmental issues, specially on medicinal plants, rare species and health issues. Students at agricultural and medical schools and biology departments in universities need ecological textbooks and training videos.

Basic environmental courses are included in the curricula of the technical college in Darhan-Uul aimag. Specialized technician-level training is offered within programs in Environmental Protection, Industrial Air Quality Control, Water Supply and Wastewater Disposal, Air Quality Monitoring, Water Quality Monitoring, Soil Quality Monitoring, Hydrology, Meteorology, Hydrogeology and Engineering Geology, Forestry, Land Management, Irrigation and Drainage, Wildlife Management, Aero-Geodesy, Cartography, Sanitary Medicine and Aero-Epidemiology

The universities and other institutions of higher education in Mongolia are the main sources of environmental professionals for all sectors of the economy. The first

environmental departments were stablished in Ulaanbaatar more than 70 years ago in different organizatons like the Ministry of foresty, Ministry of water resources and thedepartment of Hydro Meteorology.

Para. 1 of article 36 of the Environmental Law provides approval and implementation of the Government Program for ensuring public environmental education. Therefore, it is imperative regarding the public ecological education from the new developmental trends, and concepts, objectives of reforms and changes point of view. There was a need to formulate a national program and implement it in order to create conditions for the effective use of the relatively restricted technical, economic and human resources for the improvement of the level and quality of the public education.

The National Program of Public ecological education was approved by the Government of Mongolia, in 1997.

The activities are directed to the formulation the contents, forms and methodologies of training for the public ecological education on the basis of the idea of the government policies on the ecology and education and organization structures and management, capable of ensuring this kind of educational demand and needs and the improvement of the scope, quality and results of the services.

The following principles will be followed in the implementation of the Program:

- to co-ordinate with the documents and legal acts defining the strategic policies on the education and environment, as well as, with the actions for the implementation of the government and International Programs;

- to observe the new principles of the policy and actions of the renovation of state obligations and budgetary institutions;

- to organize the work for the implementation of the program on the basis of the educational levels, needs, interests and potentialities of the population;

- to adhere to the principle of increasing the need for the ecological education in the market relations, enhancing the level of its demand and ensuring its results.

The last two years organized and realized many measures for the formulation of the contents, forms and methodologies of the public ecological education, that meet the demands, needs and introduction them into training.

The Ministry of Nature and the Environment and the Ministry of Education are training peaple and formulating programs, contents and methodologies suitable to each group of consumers on the basis of studies carried out and taking into account the present situation of the ecological education of the population, their needs and demands, interests, as well as, age difference professions, qualifications and

locations.

Educational organizations are realizing the problem of training and retraining teachers who would conduct official and unofficial ecological training in order to up-grade their qualifications, and solving the problem of supplying them with text-books and other training materials. A part of the official training widely used unofficial ecological training forms, widely used such as, home and temporary training, circles, evening and correspondence courses.

Governmental organizations are realizing appropriate measures for expanding the scope ofenhancing the quality of service for the ecological education. /Expand in the scope of service and enhance the public ecological education covering the whole population through the networks of the traditional official training and newly emerged unofficial training:/

To improve the quality of the ecological education through providing knowledge and skills necessary for the solution of acute problems of ecology, health in close connection with the environmental conditions of individuals, families and institutions and collectives concerned.

One of first problems is to create a new system of structure and organization that will ensure demands and need of the environmental education, and supplying them with able personnel and improving the material conditions. By the resolution of the Government a National Council was established having the duty to provide the implementation of the Program with guidance and planning and supervision of the national level.

A member of the Government in charge of education is lead the National Council. "Mother Nature" center under the Ministry of Education has the duty of organize and co-ordinate the Program implementation on a national level and "Unofficial education" center under the Ministry of Education are providing with methodological guidance.

The work for the implementation of the Program on the local level is consulted by the council branches of the aimags, the capital city, sums, and district council branches, which have the duties to provide with strategic guidance, planning and supervision. The Governors of the respective local administrations will lead are leading the council branches.

Officers of the Governors of the aimags, ane the capital city have the duties to organize and co-ordinate the methodological guidance of the program implementation in theaimags, the capital city, sums, and districts. Education centers will be set up in thekindergartens, and schools of all levels and bigger settlements will have the duties to organize education and culture centers and training. Institutions and citizens dealing with the information, and training in the field of environmental education are encouraged and supported.

The Government of Mongolia is working for more active participation and cooperation of state, public and economic institutions, mass media and citizens in the work of the universal environmental education, and creating a new system for their duties and responsibilities.

The State and non-governmental organizations, economic units and individuals are implementating the Programme:

Participation the Government, and the central and local organizations of the state administration:

- to cover the expenses for the implementation of the Programme in the centralized and local budgets of the national and local social and economic development;

- to ensure the strategic guidance and planning and to co-ordinate the implementation of the government policy on ecology and supervise and evaluate it;

- to support the co-operation with International organizations and donor countries for the implementation of the Programme;

- to support and initiatiate the participation of the state, non-governmental organizations, economic entities and citizens.

Participation of the mass media:

- to increase the number of publications and stories on the ecological themes in the national and local press, Radio and TV , and to raise their qualities and to improve perfect their skills and forms;

- to formulate remote training programme of unofficial training devoted to the environmental education together with institutions dealing with education, environment and health and implement them.

Participation of non-government organizations:

- to carry out definite projects and other measures on the ecological education alone or together with international and other NGO's render material and financial support and supervise and involve the public;

- to evaluate the ecological education and conditions of life style of the member of their organizations, their supporters, and to reflect in their annual and long-term planning measures for the improvement of the conditions.

Participation of economic units and organizations:

- to organize studies on the government policies and laws and regulations concerning the protection of the natural environment. Rational use of natural resources

and implement them to engage production and services harmless to environment, carrying out training, advertising, and making evaluations in this respect;

- to raise the environmental education of cattle breeders, employees and trainees, decide to create healthy environment and formulate projects in this respect and implement them, support the initiatives of the collective and other organizations and render materials and financial assistance

Participation of families and individuals:

- Parents should provide ecological education to their children and other members of the family, there fore to make efforts and come up with initiatives for the correct education and set an example in this regard;

- Citizens should strictly follow the Government Laws and regulations on the protection of nature and the environment, supervise and participate actively in their implementation.

For the co-ordination of programs and projects on information, training and awareness related to ecological and health education, to carry out activities in the framework of National and International co-operation, and enhancing their effectiveness:

- to raise the effectiveness of the expenditures necessary for improving the public environmental education through closely co-ordinating the programs and projects carried out by the Government in the fields of education, ecology, health and social insurance with the structure, personnel and material conditions directly connected with their implementation;

- to co-ordinate all the programs and projects connected with enhancing the public environmental education carried out by the National Council jointly with the foreign and international specialized organizations, and effectively use their assistance and support.

The level of the ecological education of the population will be enhanced with the creation of a new sitcom of education, environment and health with the universal trends of the sustainable development of the world and the new social economic relations of the country.

2. ENVIRONMENTAL PUBLIC AWARENESS

Environmental conservation and protection cannot succeed without strong public support. The political will to develop the economy rationally and conserve and protect the environment will depend upon the perceptions and efforts of individuals and organizations. In democratic systems, the government ideally responds to the desires of the electorate. The level of environmental knowledge evinced by the populace will control the soundness of the governmental decisions. Knowledge is the key to

"countervailing power". The impetus for countervailing power and democratic change has come, more often than not, from grassroots movements in both urban and rural areas. CSOs play a critical and catalytic role in the grassroots empowerment.

They work from people's perceptions of their own needs and build on their strengths, rather than attempting to compensate the poverty with external assistance and ideas. Environmental public awareness can be defined as the perception and efforts of present and future generations on how their actions negatively or positively impact the natural environment. A public well versed in environmental awareness will create an atmosphere supportive of proactive environmental initiatives and democratic change.

If the desire to protect the environment is to be fostered, the pride and knowledge of the natural environment and the cumulative consequences of individual decisions must be strengthened and channeled into effective action through organized public awareness programs. Even if the political will exists and policy frameworks are in place, the public at large will need systematic information on new policies and the ramifications for individual activities.

However, just at a time when increased efforts are required for environmental public awareness, the transition has necessitated an across-the-board effort by the Government down-size its work force and programs. Resulting budget pressures have meant reduced funding for institutions and programs relevant for environmental public awareness efforts.

At the same time, Mongolia has experienced a surge in the number of non-governmental organizations with over 400 currently officially registered, though maybe only one fifth of these is really active. Many NGOs were created with Government encouragement and support in order to take over certain tasks, earlier carried out by the Government. In 1996 with respect to environmental issues, only an about 5-7 NGOs were active and possessed some capacity of their own to develop and implement environmental conservation measures, including disseminating pertinent information to a broader public audience. Due to the accomplishments of EPAP I, 78 NGOs implemented small pilot projects on environmental issues during 1997 and 1998.

In official documents from "Sustainable Development Program for the 21 Century", "Rio Declaration", "Espo Convention on the Transboundary Environmental Impact Assessment", "Directive of the Europe Union on Free Exchange of the Environmental Information" adopted by the world summit meeting "Environment and Development" organized by the United Nations Organization and seven conventions on nature and the environment, Mongolia has joined . have reflected, that any resolution related to nature and the environment should be open for the public and our country carries its actual responsibilities on this issue.

Environmental Public Awareness issue has been reflected in programs, implementation on Mongolian environmental legislation and state ecological policies. And basic legislative environment, trends of this activities have been formed. Environmental Public Awareness also plays a role in the implementation of

Constitutional provisions, as the Mongolian Constitution states "It shall be a sacred duty for every citizen to protect nature and the environment... The citizens of Mongolia shall be guaranteed to enjoy the rights to live in a healthy and safe environment and the right to be free from environmental pollution and ecological imbalance"

Activities for environmental protection and proper use of the natural resources have been intensified, but enforcement of governmental policies, decisions and legislation is not adequate because of the limitation of citizen's proposal and information to the government, as is government communication to the public.

First there must be perceived environmental problem before there is need to disseminate information about it. Usually the government has identified those key environmental priories for the country in for example, the National Environmental Action Plan.- and likely has policies on addressing them. Recognizing the need to organize and plan environmental public awareness at the National policy level, the Environmental public awareness Action Plan has been prepared. The National Environmental public awareness Action Plan was approved by the ministerial order of the Ministry for Nature and the Environment of Mongolia.

This Action Plan will determine methods to implement Environmental Public Awareness policies for the next 7 years.

The purpose of the Action Plan is to establish an environment for improving the psychology and ecological consciousness of Mongolian citizens in order to implement the environmental legislation, policies and decisions of the government and increase the public participation.

The Action Plan will implement the following objectives:

- public information and publicity on environmental legislation, policies and their enforcement;

- disseminate reliable information to citizens on environmental policies and trends and increase their ecological awareness and knowledge;

- reflect the public proposals and opinions on environmental issues in policies and decisions of the governmental and non-governmental organizations and make citizens more active in the protection of nature;

- restore national traditions and customs related to environmental protection and teach ecological education to the younger generation.

The Following principles will be followed in the Action Plan implementation:

- Environmental Public Awareness will be open and accessible for the public;

- increase participation of the the citizens, and non-governmental organizations in Environmental Public Awareness;

c. every citizen is allowed to express their interests freely on environmental protection, restoration and proper use.

Environmental Public Awareness shall be considered as one basic means to implement national policy. Further decisions and legislation in this field shall be developed to initiate and increase cooperation of the government, citizens, economic entities, and other organizations.

Environmental Public Awareness will assist in orientation of the public activities for an environmentally sound sustainable social and economic development.

This Action Plan shall be mainly implemented through mutual cooperation with producers, disseminators, and users of the environmental information.

Participation of women, children and the youth and restoring of national nature protection tradition shall be given special attention while citizens are participating in public awareness activities.

Environmental Public Awareness shall be organized by means of meetings, discussions, workshops, films, books, brochures, posters, games, literature, fine art, songs, poetry, tales, exhibitions, museums, galleries, libraries, tourism, and other forms of public awareness.

Foreign assistance and support of international organizations shall be expanded in Environmental Public Awareness.

By the resolution of the Ministry for Nature and the Environment a National Council of Environmental Public Awareness was established which shall be responsible for supervising and managing implementation strategies of this Action Plan.

Environmental Public Awareness for people living around protected areas shall be organized and delivered through the information centers of the protected areas.

Government Regulatory and Implementing Agencies and the National Council of Environmental Public Awareness shall be responsible for providing professional instruction on Action Plan implementation and monitoring and evaluation of Action Plan implementation.

Action Plan implementation project will be developed and relevant state administrative and non-governmental organizations, a press and information institutions will be included in this activities.

Ministry for Nature and the Environment and non-governmental organizations shall organize activities for retraining of the personnel of economic entities and

organizations and citizens which are responsible for environmental awareness activities, education and training and strengthening their material basis, and providing with information and methodological instructions

Ministry for Nature and the Environment in cooperation with the relevant other organizations shall organize activities for establishing databank of use, protection, depletion, and restoration of natural resources, environmental changes and degradation as well as for public awareness, providing with information, based on data processing.

Environmental information will be disseminated and aware to citizens, economic entities and organizations through a central and local network.

The development of Ecotourism and expanding art and culture activities on environmental awareness, enrichment of environmental information and data in natural museums and libraries, in cooperation with relevant environmental, non-governmental organizations will be organized.

The Aimag and Capital City Governors shall discuss and conclude the information and reports provided by Sum Governors, economic entities and organizations related to Environmental Public Awareness.

The Sum and District Governors shall receive and summarize environmental information within set time in their territories and deliver it to Aimag and Capital City Governors Administrative Departments, and receive public information and resolve it.

The Aimag, Capital City, Sum and District Governors shall organize Environmental Public Awareness activities through all means of mass media in their territories.

The Aimag, Capital City, Sum and District Governors shall develop and implement Environmental Public Awareness subprograms.

Pursuant to their own regulations, the non-governmental organizations shall manage their own Environmental Public Awareness activities.

The Non-governmental organizations and the press, art, cultural and religious organizations shall organize training, meetings, and conferences concerning restoring nature protection traditions.

Implementation of the Action Plan shall have the following results:

-The Environmental public awareness activities of governmental, non-governmental and local organizations will meet public needs.

-The Environmental public awareness actions will become part of the permanent work of journalists, press officials, environmental inspectors and specialists of our country.

-There will be real progress in resuming and developing national traditions and in the public ecological training and education

-The Psychology of citizens to protect environment will be formed and become active in proper use of natural resources, increase the effectiveness and improve implementation of policy, decisions and legislative acts.

All living creatures of the Earth are inter- dependent with nature. The future of humanity will depend on its attitude toward nature. It would be a sacred cause if one would keep in mind this holy essence and work to safeguard the Earth for succeeding generations.

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Development and Implementation of an Environmental Education Programme by the Sabah Forestry Department

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ABSTRACT

The forestry industry is one of the oldest and most important industries in Sabah. Although revenue from timber has declined in recent years, the industry still plays a significant role in contributing to the state's revenue and its economic development. To ensure the industry's contribution, the Sabah Forestry Department (SFD) has taken bold steps towards promoting sustainable forest management. Various initiatives have been taken by the Department to support this goal. Environmental education (EE) was considered an important approach to bring about positive change in the attitudes and behaviours of the public towards the forests and the environment as a whole. Thus, an EE programme was developed in 1996, targeting teachers, school students and the public. This paper will focus on our experiences during the development and implementation of the programme. The various obstacles encountered, and steps to overcome them, is discussed.

INTRODUCTION

Sabah is the second largest state in the Federation of Malaysia with an approximate area of 7.37 million hectares (ha). Situated on the northern part of Borneo Island, its climate is marine equatorial with low variance in the average temperature of 26° C. Floristically, Sabah belongs to one of the oldest and most complex ecosystems of the world. In general, the vegetation of Sabah covers a wide range of forest formations. The most dominant forest type is the Mixed Dipterocarp Forest, so called due to the high dominance of Dipterocarpaceae trees. Dipterocarp species constitute the main portion of commercial timber produced—as much as 90% of the total volume in 1989.

The State has been heavily dependent on its timber resource as a major revenue earner. In the past 23 years, forest revenue constituted an average of approximately 55% of the total State revenue, peaking in 1979 with around 77% (RM1.1 billion or USD289 million, current exchange rates). Therefore, the forestry sector—in particular timber

extraction—has been the backbone of the State's economy for the past 3 decades and this has driven the rapid pace of economic development.

In order to maintain a steady supply of timber and other non-wood forest products, and to safeguard the important social and environmental functions of the forests, the State Government has endorsed the implementation of sustainable forest management (SFM). This move is also in line with Malaysia's commitment to protect and to conserve its environment—in particular, to the goal of the International Tropical Timber Organisation (ITTO) to bring all tropical rain forests under sustained-yield management by the year 2000.

The Sabah Forestry Department (SFD), assisted by the German Government through the German Agency for Technical Co-operation (GTZ), started a project in 1989 aimed at introducing sustainable management practices for 2.5 million ha of commercial forests. The SFD is currently converting its management practices from pure exploitation to sustainable forest management. Substantial positive amendments are being made with regard to the current political framework conditions, organisational structures, forest management procedures and implementation practices.

One bold step was to develop and implement an environmental education (EE) programme for school students, teachers and the public in and around the Sandakan district of East Sabah. Although there is no forest management component here, the SFD considers EE vital to bring about positive change in the attitudes and behaviours of the public towards the forests and the environment as a whole.

DEVELOPMENT OF AN ENVIRONMENT EDUCATION PROGRAMME

The Rainforest Interpretation Centre

In 1995, a facility called the Rainforest Interpretation Centre (RIC) was constructed with funds from the German Government, through the GTZ, and it is run by the Forest Research Centre (FRC). The RIC is situated in the Sepilok Arboretum near the Kabili-Sepilok Forest Reserve (more well-known for the Sepilok Orangutan Rehabilitation Centre). Adjacent to the RIC is a large pond surrounded by an 800 m-long trail called the Rainforest Walk. These facilities are situated just 25 km west of Sandakan town. It is easily accessible by most of the schools in the Sandakan Region.

The RIC was considered a suitable place to implement an EE programme due to its location and its natural surroundings.

The RICEEP

Originally intended as a tourist facility, the function of the RIC was further expanded to include an environmental education programme. This initiative was coordinated by the FRC with the help of volunteers who were supported by the World Wide Fund for Nature (Malaysia) under the Sabah Education and Rural Development

Programme. Thus, the development of the Rainforest Interpretation Centre Environmental Education Programme (RICEEP) began in January 1996 by staff of FRC and volunteers brought in through WWF Malaysia.

The main goal of the RICEEP is to bring about positive change in the attitudes and behaviours of the public towards the forests and the environment as a whole through interpretation and education. This is in line with the concept of sustainable forest management that includes the change of attitudes concerning the ecological and social functions of forests. The target groups for the RICEEP are school students, teachers and the public in the Sandakan District.

The RICEEP was divided into 3 components determined by our target groups:

- EE for Students.
  In this component, we deal with conducting EE activities for school visits to the RIC. Many activities were prepared for use at the RIC and its surroundings. These activities were specifically designed to develop certain skills within a particular age group, ranging from 7 to 18 year olds. Different activities can be combined to make day programmes for school visits.

- EE for Teachers.
  Our aim in this component is to guide teachers in infusing EE into their teaching practices. It also trains them to plan, organise and implement EE programmes in their schools and at the RIC. Two types of workshops were planned for this component: the one-day 'Introduction to Environmental Education Workshop', and the 5-day 'Residential Workshop on Environmental Education'.

- EE for the Public.
  Our aim in this component is to raise public awareness regarding the forests of Sabah, and the environment as a whole, through effective interpretation. To achieve this, the RIC and the adjacent Rainforest Walk is used. In the RIC, various topics relating to the rain forests of Sabah were already on display prior to the implementation of the RICEEP. In addition, a guidebook to the adjacent trail, the Rainforest Walk, was also developed for visitors.

In the development of the RICEEP, an Australian EE expert was engaged as Technical Advisor on voluntary basis. Volunteers and several FRC staff have been instrumental in the development and initial implementation of the RICEEP.

IMPLEMENTATION OF THE RICEEP

To implement the RICEEP, the Environmental Education Unit (EE Unit) was formed in February 1997 within the Forest Research Centre (FRC), the research arm of the SFD. A Programme Co-ordinator was engaged. Initially, the Co-ordinator and a few staff of the FRC ran the Programme, as the Unit was very new.

Component 1: EE for students

After the activities and associated tools were prepared, letters of invitation to participate in our Programme were sent to about 171 primary and secondary schools in the Sandakan District. Brochures on the Programme and application forms for visits were attached to the letters. Initially, we only entertained bookings made through the application forms.

Our programmes for these visits are mainly at the RIC and its grounds. However, there is an option for a brief visit to the Sepilok Orangutan Rehabilitation Centre (SORC) located just 2 km away. Almost all groups opted for the visit. Therefore, we have also incorporated certain activities that students can do while at the SORC, for example, understanding the different structure of the rainforest at the SORC and the RIC.

Every school visit has a day programme customised to the needs of the teachers or students so that no two visits have identical programmes. Teachers are consulted for activities to be included in the programme of their visits. However, for teachers who are not able to do this due to communication problems, they would leave the programme arrangements to our discretion.

Most of our school visits are on Saturdays and Sundays. To date, we have had 28 school visits, averaging one visit per month. The response to this component of the programme is not as encouraging as we had expected. The reasons for this small number are:

- Most teachers view school visits as merely 'school outings' and not educational experiences for their students.
- It is difficult for teachers to convince parents to allow their young children (age 7–10 years old) to go on excursions, especially those that include going into a forest.
- Due to the economic recession beginning late 1997, nation-wide governmental budget cuts also affected schools to some degree. Therefore, school excursions were not encouraged for the past two years. The budgets for school excursions are usually limited. In some cases, the students' parents have to bear transportation costs. This option is not appropriate in schools where the majority of students come from low-income families.
- Our initial policy to accept bookings only by post or fax was not a good one. Some schools are located in areas where the postal service is unreliable. Bookings by teachers or other applicants using public telephones or cellular phones were turned down. However, we have now revised that policy.

Component 2: EE for teachers

We conduct two categories of one-day workshops—one for primary school teachers and another for secondary school teachers. We also conduct five-day residential workshops, which are intended for teachers who have already participated in the one-day workshops.

The consent of the Education Department (Sandakan Branch) was sought prior to conducting the Workshops as they involve the training of teachers. As such, the Department offers assistance in contacting and getting participants for the workshops. Other preparations also included producing a guidebook, called the 'Teachers' Guide to Environmental Education'. It has been through several drafts and the final is being published.

One-day workshops are conducted at the FRC and the RIC. Five-day workshops are also held in these two places but include a 2-day field trip to Deramakot Forest Reserve, a model forest reserve for the Sustainable Forest Management System.

Initially, we planned to organise one-day workshops monthly and the five-day workshops twice a year. However, this was not possible because of the following reasons:

- The EE Unit was under-staffed. There were, and still are, only two designated persons in the Unit—the Project Co-ordinator and a Project Assistant. Occasionally, assistance was offered by other staff from various sections within the FRC and by volunteers. However, these transient support were not adequate for organising the workshops and managing the other components of the RICEEP.
- We are not able to conduct workshops during school holidays or other long holiday breaks, as teachers would spend them with their families.
- The cultural diversity of Malaysia resulted in festive holidays in addition to the normal holidays. Therefore, we cannot hold these workshops on these cultural holidays, as some teachers might not be able to attend.

Component 3: EE for the public

This component is divided into two parts—raising public awareness through the RIC and the Rainforest Walk, and through various activities beyond the RIC. Due to commitments to the previous two components, we were only able to devout more time for the second part this year.

Reaching In

Researchers at the FRC designed the exhibits at the RIC and the outdoor signs along the Rainforest Walk. They include plant taxonomists, ecologists and entomologists. Understandably, the resulting text used was very technical and quite

difficult to understand. Moreover, all text was in English. Thus, the effectiveness of the exhibits in raising awareness among the public was considered very low.

However, we are in the process of upgrading these exhibits to make them enjoyable, relevant, organised and thematic. We hope these new exhibits will be effective in communicating rainforest issues to the public.

Visitors, mainly tourists returning from the Sepilok Orangutan Rehabilitation Centre, visit the RIC and the adjacent Rainforest Walk daily. To assist them, staff of the FRC take shifts to be on duty at the RIC.

We also conduct programmes, similar to those for students, for other local group visits. These may be from churches, institutions of higher learning, and from nature camps for students.

The main problem we have with this part of Component 3 is to evaluate its effectiveness in raising the visitors' awareness on the forests of Sabah and the environment as a whole. Visitors are rarely interested in filling out forms and questionnaires. However, we have received their good comments concerning the exhibits through a suggestion box.

Reaching Out

This part of the component concerns our activities beyond the RIC and the Rainforest Walk. These activities are:

- organising annual World Environmental Day camps for school students,
- commemorating the National Environment Week,
- conducting Nature Interpretation Workshops for the staff of the Department's Extension & Education Division,
- participating in nature exhibitions organised by NGOs and schools, and
- assisting individuals or groups who are interested in EE.

We have just started conducting Nature Interpretation Workshops. The first was for the staff of the Department's Extension & Education Division. Some of the responsibilities of the Division include raising nature awareness through holding talks in schools, organising quizzes and nature camps, promoting the Department's Nature Centre around Sabah, etc.

The main focus of the workshop was to improve the interpretive skills of the staff in designing educational exhibits, conducting talks and producing brochures. A similar workshop will be conducted in November 1999 for staff of various government agencies who were identified as interested and actively involved, either directly or indirectly, in EE or nature awareness programmes.

We have also participated in various exhibitions this year. Besides designing exhibits bases on the general theme or aim of the exhibits, we have also used the opportunities to promote the RICEEP to interested teachers and other individuals.

As in the previous part, we are unable to directly evaluate the impact or effectiveness of these two activities (Nature Interpretation Workshops) in raising public awareness. However, we are optimistic that these workshops will result in improved exhibition centres, guided walks and the educational programmes in the various nature and visitor centres around Sabah, thus collectively raising public awareness.

OBSTACLES AND OVERCOMING THEM

Understandably, there were obstacles that hindered the smooth development and implementation of the RICEEP. Management obstacles are easier to overcome than obstacles resulting from conflicting mind-sets and interests. Here are some of the obstacles that we have encountered.

Concerning staff

- The development of the RICEEP was mostly carried out by foreign volunteers supported and supervised by a few dedicated staff of the FRC. However, apart from a Project Co-ordinator and an assistant provided for by the government, it was problematical to acquire additional staff to implement the project. The FRC is a forest research-based centre and its staff are not trained in EE and EE-related matters.

- From the on-set, we had clerical assistance from other staff. For organising larger programmes, such as World Environment Day camps, the assistance from other research officers and staff was requested. However, assistance such as these was not always available as the priorities of the other staff lie elsewhere. Thus, we had problems in conducting activities at the RIC, especially with school groups of more than 20 students. This problem was to some extent resolved by getting two local volunteers early this year.

Concerning EE for Students

- During the first year of implementation, teachers regarded school visits to the RIC as weekend-outings for students and did not expect them to be very educational. This attitude has since changed—most teachers are interested in customising the programmes of their visits and they show interest in the activities conducted. The change in attitude is brought about by previous visitors' telling others about their experiences at the RIC and probably other camps that we organised.
- In Malaysia, the Malay language is the medium of instruction in schools, with the exception of Chinese- and Indian-language primary schools. Although English is taught as subject, the level of proficiency in the language is generally not encouraging. Therefore, students find the

exhibits at the RIC difficult to understand as all are in English. As the RIC was originally intended for foreign tourists, we redesigned our activities so as not to involve reading too much text. We are also currently up-grading the exhibits to be more readable for these students.

- We realised that secondary school students (age 13 to 17 year olds) are often less receptive and uninterested in our activities. In order to continuously capture their attention, we have kept the numbers in a group smaller (a maximum of 20 in a group). Besides employing a slightly different communication strategy, we have also added games that emphasises problem-solving and decision-making skills.
- A constant aggravation from teachers organising school outings is that transportation costs will have to be borne by the students. Most schools do not have their own school buses and therefore need to rent buses or other public transportation. Schools rarely subsidise transportation costs. This results in certain schools—with a majority of students coming from lower income families—not able to organise visits for their students.

Teachers wishing to bring their students out of school also need to seek prior approval from the State Education Officer at the Education Department. This procedure could take weeks, thus deterring the teachers from applying in the first place.

Concerning Teacher Training

- Although the Education Department has offered to assist us in getting teachers to participate in our workshops, there are some communication problems that resulted in poor turn-ups and misinformation concerning venue, time, attire and so on. We have tried to resolve this problem by contacting the proposed participants prior to the workshops for confirmation of attendance and to answer queries.
- A small number of teachers turned down the invitation to participate in the workshops. This was due to the unclear benefits of attending the workshops. This has also resulted in poor attendance for the workshops. To resolve this problem, we prepared brochures for the workshops that were sent to the proposed participants at least two weeks prior to a workshop. Contacting them to reconfirm attendance also serve as an avenue to brief them on the workshops and its activities.
- There are school principals who are not supportive of their teachers interested in attending these workshops. This is partly due to the routine where schools abide by directives from the Education Department. Therefore, a workshop organised by another department is considered less relevant to them. Fortunately, the invitation letters to teachers sent through the Education Department (Sandakan Branch) helped us to a certain extent.
- Another misconception by certain school principals is that the workshops are relevant only to those teaching science-related subjects. As a result, they would often send Biology, Chemistry, Physics and/or General Science teachers only. This defeats the policy of the Malaysian Ministry of

Education to infuse EE across the school curriculum. As a rule, prior communication with the teachers concerned is vital to ensure their participation.

- Heavy school workloads are also a hindrance for teachers to attend our workshops.

Concerning Public Awareness

- We received an average of 1,500 visitors per year excluding school groups. Efforts to increase the numbers include sending the RIC brochures to various tourists-related venues such as to the nearby Sepilok Orang-utan Rehabilitation Centre, tour operators and hotels.

Within the Sabah Forestry Department

- The main objective of the SFD is to administer and manage the forests of Sabah. Although we have always had the full support of the Director of Forestry, the general attitude towards the activities of the RICEEP is that it is childish and not important. This may be due to the prominence of our activities for students and/or the lack of awareness on our Project. It may also stem from the failure to perceive and appreciate the importance of education as a long-term effort to achieve sustainable forest management. We have tried to counter this attitude by promoting the Project and its activities through organising in-house seminars and workshops.
- At present, the RICEEP receives a three-year partial funding from WWF Malaysia, in addition to funding by the SFD. However, permanent governmental financial support is needed to sustain the programme. There are already plans by the Department to include an EE component in a proposal for funding under the Eighth Malaysia Plan.
- The contribution of the RICEEP does not result in immediate change in the target groups. Therefore, most people regard the Programme as unimportant as there are no quantifiable results to evaluate its effectiveness.

CONCLUSION

The RICEEP is one of the most important vehicles of the Sabah Forestry Department to educate the public concerning the forests of Sabah and its conservation through environmental education and effective interpretation. The EE Unit encountered many obstacles since its development and then during its implementation. We have succeeded in over-coming most of them. Some obstacles somehow disappeared, while a few others stayed on.

We, in the EE Unit of the SFD, believe that we are playing a part in making positive changes for the future, especially concerning environmental attitudes. It is this

belief that will drive us to continue the RICEEP in the years to come. Like the few obstacles, we will stay on.

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Forest For Life Campaign and its Environmental Education Programs

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INTRODUCTION

The campaign of *Forest for Life* started in March 1998 when South Korea was undergoing the financial crisis and the unemployment rate became the most prominent social problem. The campaign set the three goals comprised of environmental, economic and cultural objectives as follow:

The first objective of *Forest for Life* campaign is to foster the economic development by citizens' participation in the forestry activities including pruning and thinning. The second objective is to conservation of forest ecosystems by means of tree-caring activities such as planting and thinning plantation forests. The third objective of campaign is to foster the environmentally friendly culture by regaining the traditional philosophy harmonizing human activities with the nature. For the second and third objectives to be pursued, environmental education programs are developed and being operated in the field. The following are examples of programs operated by the voluntary members of the organization.

- Participation to the forestry activities for a day
- Field education of students visiting the demonstration forests about forest ecosystems and forestry.
- Monitoring forest tending operations by the public agencies
- Organizing forest-related cultural activities
- Research on the forest conservation and forestry culture
- Policy formulation on forestry and forest ecosystem conservation
- Providing technical and financial supports for district schools to establish their own forest on site in the school or near by.
- Managing the demonstration forest as a model forest by people's participation.

EDUCATION PROGRAMS ON FOREST CONSERVATION

Forestry Experience in the Demonstration Forests

People, usually from firms or schools in urban areas, can arrange a visit to the demonstration forest for the experience with a forest. They are welcome by the forest ranger and an environmental interpretation volunteer at the forest. There are four demonstration forests designated for the field forestry experience. Among them two forests are owned by universities while the others are owned by the Forestry Administration. The target groups of this program include students at the high school and university levels, leaders in all walks of life, and employees from corporations. The program is consisted of practice of forestry works, education on forest ecosystems, and recreational activities. The program has been successful in changing the public perception on forestry and the importance of forest conservation. The program is rather new in Korea such that there are not many educational activities developed yet and there are few trained environmental interpreters who can run the program.

University Student Volunteer Program for Forest Farms

It is a tradition in Korean universities, students usually volunteer to work in rural village for a couple of days per semester to help the rural communities. Some of universities provide students with a credit as an incentive for the program. The *Forest for Life* organizes forestry volunteer programs for university students such that rural forest-based communities could be served with the work of university student volunteers. Some times student volunteers can work with industrial forests owned by forest industries. There are some volunteer organizations, which arrange the program in partnership with the Forest for Life. Participants in this program some times become members of *Forest for Life*, who will support the supporters of forestry sector. There are some problems with this program associated with this program. One of them is that there are more forestry majors while non-major students are seldom.

Forest Camp Program

This program is operated during the summer breaks and somewhat exclusive to non-members of the organization. Major targets of this program include primary school students and member households. Participants to the program, consisted of youngsters and their parents can make their relationship tighter. There are not many facilities for the program can be run frequently operated with limited capacities. There is a need for instruction programs to be run in the forest by rangers.

Nature Classroom for Grades 4-8

The program is provided in arboretum and designated only for young students of grades 4-8. Once a month the nature classroom is open to students accompanied by teachers and parents coming from mostly cities. The program is well received by participants even though there are some difficulties. Among them are shortage of trained teaching staff in the field and well-designed instruction materials, especially for the bad weather situations.

School Forest Program

There are not many schools, which have a place to be used as learning site for environmental education in school. Most of schools in Korea has a fairly large school ground which is almost exclusively used by sports teams and for physical education. *Forest for Life* designed a program for schools to develop a small forest on their own school site for environmental education. The Government of Seoul Metropolitan has agreed to cooperate with *Forest for Life* in helping schools to plan and implement the development of school forests. This is an environmental education just started this year, thus we do not have any result to discuss about it yet.

CONCLUSION

As the environmental education programs of *Forest for Life* is newly developed, there are many shortages yet to be filled in the future. Among them are shortages of well-trained instructors, lack of instruction materials and financial support for the program development and operations. The programs in most cases are offered on the basis of request or demand from the participants. Thus the programs are not regularly run even though the demand is expected to grow in the future. Therefore it is necessary to plan regular environmental programs offered for the general public as well as members of the organization. In order to provide a regular program with high level of education effects, it might be necessary to open a year-round school, which offers forest education programs at different levels or for different groups. There is a need for educational research for the new school forest project to be efficiently utilized by the school and students in their learning and teaching.

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Planning and Conducting an Environmental Education Workshop in a Rural Malaysian Community: A Case Study of Participation and Research

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ABSTRACT

The University of South Africa (UNISA) and the Malaysian Nature Society (MNS) engaged in a collaborative research project to determine how rural communities can be empowered through environmental education workshops to improve their understanding of the environment in order to contribute to their own sustainable living. The research indicated, on the one hand, that there are some barriers to research in communities, but on the other hand, that environmental education could be a useful tool to improve the attitudes and knowledge concerning the environment in rural communities. As a result of the outcomes of the research, the community that participated in the research reviewed in this article also participated in further workshops and information sessions about the environment.

INTRODUCTION

Both Malaysian and South Africa are renowned for their biological diversity and richness in natural resources, which are often taken for granted. The rapid destruction of some ecosystems may, however, lead to the loss of this heritage. Situated in the botanical region of *Malesia* (which encompasses Malaysia, Indonesia and the Philippines to New Guinea), Malesia has been acknowledged as one of the "mega diverse" countries in the world, with over 15 000 flowering plants, 736 recorded species of birds, and 286 mammals (National Biodiversity Policy report 1998:1). Like wise it is estimated in the South Western Cape in South Africa (0.4% of the worlds surface) is inhabited by about 1 300 plant species per 10 000 km2 (Kidd 1983: 11). The Kruger National Park in the northern parts of the country (1 948 528 ha) is home to, amongst others, 2000 plant species, 51 snake species, 57 lizard species, 507 bird species and 147 mammals (National Parks Board 1995:1). The importance of these countries on a global

basis to draw on for endangered resources such as wildlife, fertile soil, an unpolluted atmosphere and genetic variety cannot be over emphasized.

However, the need for development to fuel the economy has taken precedence over conservation and care for the environment. To many people industry equals income. While the average wealth in these countries has risen, serious distortions occur in the distribution of human welfare, where the rich are growing richer and the poór increasingly poorer. Environmental change caused by the expansion of rapid economic activity has resulted in resource depletion. Environmental problems encountered for many years such as deforestation, desertification and erosion persist, while new ones, such as the depletion of the ozone layer and global warming are being created. Over the last decade more and more people are beginning to see a shift of the paradigm of "humanity is master over nature" to humans are stewards of the environment".

Two researchers, recognizing the problems mentioned above, initiated a collaborative project in the two counties mentioned, where very similar conditions and problems prevail. The demography of the countries is similar in that both have sections of the population living in urban areas and sections living in rural areas. Those living in rural areas are usually poor, lack good education and basic facilities and depend directly on the environment for food and shelter. The population of the countries differ mainly in respect of the religion (Malaysia being mainly Moslem and the South Africa mainly Christians). The project discussed in this article forms part of a larger project entitled: *The empowerment of rural communities through development and environmental education.* The aims of the projects are to encourage a community to identify issues affecting them and to explore ways of solving or addressing these issues through education and communication. The research focuses on determining qualitatively what the needs, beliefs, attitudes etc of the community are about and how their relationship with and understanding of the environment can be improved. This article focuses on the first phase of the sub-project undertaken in Malaysia.

The Participating researchers in the project were: Mr. Gary Lim, Chief Education Officer of the MNS and principal researcher in Malaysia itself, and Prof. Callie Loubser, lecturer at the Faculty of Education UNISA and coordinator of the larger research project.

1. METHODOLOGY

The research approach followed in this project was a qualitative research survey. For this purpose, the objectives of the research were to:

- Do a qualitative situation analysis of attitudes of rural communities towards the environment
  (Including beliefs practices perceptions, needs, etc).
- Determine whether there are barriers towards existing environmental education programmes and if there are, to determine what could be done about removing the barriers, in collaboration with the local community.

- Establish structures to empower the relevant community through environmental education programmes

2. THEORETICAL BACKGROUND.

2.1 What is a community?

There is no clear-cut definition of the term "community". Many definitions are structured in an ecological sense and refer to plant or animal communities etc. Defining "human" communities is something different and the specific definition depends on the context of the particular community. Si Khan (1994:3) states an example where somebody defines their community as poor black people in an area in the USA, which at the same time could be a sub-group of other communities: town, country, state, black people, etc. In the project under review, the community is meant as a community living in a rural area, characterized by poor living conditions. It seems therefore, as if it is left to the researcher, facilitator or community worker to define the community he/she works in. Once this has been done, he/she should be prepared to work with all its members (Khan 1994:4)

2.2 Why focus on rural communities?

The United Nations Economic Commission For Africa (UNECA) (in Makumbe 1996:3) states the following; *within African countries the initiative and vitality of the rural poor have far too long been sapped by the rural rich and the government officials from the city.* While this may be evident in a developing country such as Zimbabwe, Robinson and Shallcross (1998:198) admit that approaches based on locally focused (rural) priority assessments are much more in evidence in many parts of the less developed world than in Britian and constitute a model that could inform practice in Britain. Pausewang, Cheru, Brune and Chole (1990:3) argue that rural development is an indispensable prerequisite for the maintenance of a minimum basic living standard for a growing population. They also make the following important statement concerning Ethiopia: (*almost 90% of the population depend on agriculture for their livelihood).*

From these statements it could be deduced that there is a definite need for rural development and knowledge gained from work in rural communities in the developing countries may inform more developed countries. This statement has, however, not been proved and the broader project may shed light on such a statement because of the presence of participants from both developing and developed countries.

Views about rural people and their role in the environment may differ widely. Ngwaimbi (1995:25) states that the rural areas in Africa have rich resources, from untapped minerals to under-tapped human potential. Their culture and values have remained intact despite harsh environmental conditions such as wars, etc. and Ngwainbi (1995:260) argues: *Why should others seek to replace those information sources with sophisticated electronic and telecommunication technology when the former agents are cheaper, familiar to village people and hence easier to manage?* This argument immediately puts a different perspective to the concept of development

The African Charter for Population Participation (in Makumbe 1996:4) uses the term "human centered development" which should aim at improving the well-being and living condition of the people. It further states that Africa should realize that, both geopolitical and economically it is becoming increasingly marginalized in world affairs and its greatest resource is its people. This argument is used by Makumbe, after stating that government in Africa rarely responds to the needs of their people. The call is therefore for the *empowerment* of the people to determine the direction and context of development, which considering the state of absolute poverty in which many Africans live has not taken place in Africa. Vettivel (1992:7) also concurs that economic improvement immediately led to greater social status and empowerment of the people in India. The social, economic, environmental and technological dimensions of development can, therefore never be ignored. This emphasizes the need for studies to determine the best ways of addressing the empowerment of rural communities.

If development is introduced successfully in rural communities, the concept of sustainable living will immediately assume importance. To many people, sustainable living means the balance between conservation and development (use of resources) (Matjokana 1998; Loubser 1996:98). The concept of sustainability therefore merits consideration in community projects.

2.3 The relationship of communities and the environment.

Although community empowerment and development have to be studied in general for the broader project, the main focus will be on the environment and the influence of communities living in rural areas on natural resources and agriculture. Many communities in rural areas depend solely on the environment for their existence. Houses are built of materials from the environment. Food is obtained or produced from the environment and many people work as farmers. This relationship with the environment has been the subject of many research projects, but solutions to the problems presented by it seem pending, since poverty prevails on an alarming scale in the developing countries where such relationships are the order of the day.

Approaching rural communities.

One of the objectives of this project is to learn more about ways to approach communities. This seems to be an obstacle in many countries and communities. Swanepoel lists the following core obstacles to community development (1989:8-9):

- Illiteracy
- Customs and tradition
- Dependency
- Apathy

Swanpoel (1989:8) states that the very reason why community development should take place, also act as obstacles in the way of successful projects. Issues such as poverty and the lack of self-sufficiency and self-reliance found in a particular

community make it very difficult to involve people in a community in development efforts.

In view of the difficult and sensitive nature of approaching and working in rural communities, community workers could consider the following points:

- The first decision of a person who wants to work in a community is to decide how and when to enter the community.
- The first entrance into a community may be the last opportunity to gain the trust of the community. Mistakes made in an attempt to approach a community and gain the trust of its members may be associated with the researcher, facilitator or community worker forever.
- Most community workers cannot select a community at random, because they work for an organization. They should therefore focus on promoting their own acceptability and the image of their own organizations to the community.
- If the community worker is in a position to select a community, the strategy of approaching the community can be planned carefully before hand.
- It is useful for the community worker to have some existing link with the community. It would be very valuable to stay in the community.
- Community workers should preferably be able to choose their own initial contacts but sometimes the organizations they work for prescribe these contacts.
- Community development can only be a learning process if people really participate (Swanepoel 1989:2)
- The community must be made aware of the exact purpose of the project. What needs should be addressed and who should address them?

2.4 Doing a situation analysis

After making contact with a community, the next important step is to assess the community structures. It may be necessary to determine both abstract and physical information. Abstract information may include aspects such as attitudes, beliefs, religion, habits and culture of the community. Physical structures could include the population size, housing facilities, job opportunities, school facilities, transport etc. Swanpoel (1989:23) for example, regards determining family ties in the community as a very important step, because in communities a family is a basic social structure (abstract structure). The community worker should also know some of the finer details about abstract structures, such as political positions, to enable him/her to maintain a neutral position. It is useful to know physical structures in order to determine what role the community worker can play in satisfying the community's physical needs.

2.5 Strategies to improve environmental conditions in rural communities.

This project as mentioned before focuses on rural communities. However it also focuses on the role of the environment in the community life. Rural communities in developing countries are usually poor and very dependent on the environment for their daily living. They are also usually isolated from the outside world because there are no means of communication (transport as well as telephones) and their skills and

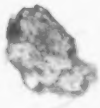
knowledge often lack the finesse characteristic of others.

One useful approach to the above problem seems to be the Participatory Rural Approach (PRA) (Rey 1997:7). This approach can be described as a family of approaches, methods and behavior that enable people to express and analyze the realities of their lives and conditions, to plan themselves what action to take and to monitor and evaluate the results. Obviously this approach should be an important thrust behind a project such as the one described in this report.

3. APPROACHING AND SELECTING A COMMUNITY IN MALAYSIA.

Various communities were targeted for the workshop to determine the environmental needs and perceptions of those communities, taking into account key consideration such as:

- location
- ethnic groups
- literacy level
- logistics ands preparation for the workshop
- previous contacts
- communication methods.



The above points were considered essential for organizing a workshop, as the location would determine how often the researcher would be able to approach the community and gradually gain the people's trust and willingness to share their views. The reason for identifying a suitable ethnic group is relevant to the project title, as historically and traditionally the Malays and the indigenous people have been residing in the rural areas, although there is a rural –urban migration trend – by the year 2000 more than 50% of Malaysia's population will have migrated to urban areas (UN-ESCAP 1996:5)

Consideration of the literacy level is obviously necessary, as certain terminology will have to be used to explain environmental education and invite participation during and after the workshop. However it should be emphasized that illiteracy should not be confused with a lack of knowledge, understanding or wisdom. An indigenous boy in Malaysia could, for instance, identify more varieties of plants and their uses than a professor of botany. *The fact that a knowledge system that has no bearing on the collective wisdom of the past is bound to fall short of the demands places upon it, is emphasized by this example and contributes to the emphasis placed on a search for environmental literacy through the research reported in this article.*

Finally, the Malaysian research partner's previous contact and experience in a community made access to the community much easier, as a certain measure of apprehension or "barriers" amongst the members of the community would have been present if he had been a total stranger to them. A number of communities were subsequently approached.

a) A resettled group of indigenous people at the outskirts of Kuala Lumpur. This community was previously residing in the grounds of the Forest Research Institute of Malaysia (FRIM) before it was institutionalized. They belong to the tribe of "Temuans" which are a sub-tribe of Proto-Malays found mostly in the Southern Peninsular Malaysia. Today they are resettled in a village cultivating orchards and trying to supplement their income from odd jobs. Some of the younger ones have managed to secure jobs in the factories or retail shops nearby. The approach mentioned was unsuccessful.

b) A coastal community fringing the main port of Kuala Lumpur. This community consists of descendants of the "orang laut" or seafarers of the early years. Found mainly in the Central and Southern Peninsular, members of this group have relatives today engaged in tapping rubber and working in palm oil plantations. (In this instance, the approach was likewise unsuccessful.)

c) A village along the coasts of Pantai Remis, in the central state of Perak. This village is known as Kampung Teluk Senangin, off the main road to "Damar Laut". Translated directly, the name of the village means the "Gulf of Senangin Fish" while "Damar Laut" means "sea resin". In the forest of South East Asia, Damar Laut belongs to a tree of the family of Dipterocarpaceae, a valuable swamp timber species. This approach was successful.

d) Teachers' workshop for schools identified under the Malaysian Nature Society Eco-club project. This important environmental education outreach is part of an annual programme to train a pool or teachers and advisors who will then form support groups for their respective areas. A workshop was conducted between 27 and 28 April 1998. This was regarded as an ongoing project, but was found to be not suitable enough for the broader research project.

4. THE PROCESS OF SELECTING THE KAMPUNG TELUK SENANGIN COMMUNITY

4.1 Description of the selected community

- Location

This village, referred to above as Kampung Teluk Senangin, is about four hours' drive or 280 kilometres from the capital of Malaysia, Kuala Lumpur. Access is gained by way of the North-South Expressway exit at the Batu Gajah junction for Lumut and Pangkor. It is situated about 8 kilometres from the Lumut Power plant, Malaysia's biggest Independent Power producer (IPP)

The original habitat comprised coastal forests with mangroves occurring at the fringe of the coast. Here the forests evolve gradually from coastal mangroves and peat swamp to secondary and hill dipterocarp forests. More recently, extensive oil palm plantations have been introduced.

This area is under the administration of the Manjung District Office of the state of Perak, Central Peninsular Malaysia.

- Village and community

About 12 wooden and semi-wooden houses belonging to Malays are scattered along the coast of Kampung Teluk Senangin. The village has only recently been equipped with electricity (about 18 months ago), while water is gathered from ground wells. The closest house is situated 15 meters from the high tide mark, resulting in the well-water being slightly brackish due to saltwater intrusion.

This appointed headman informed the researcher that the first settlers had come from the districts of Sik and Pendang, the "rice bowl" of the northern state of Kedah. Here the villagers' main form of subsistence is fishing. However, the more ambitious ones have started constructing chalets for weekend tourists. There is one general provision store which is operated by a family who actually live closer to the fringe of the forest reserve than in the village itself. The villagers are probably expecting tourism to be the "golden goose" that will bring them steadier income and create jobs for their children.

The closest primary school is situated about seven kilometers away in Segari, while secondary students pursue their education at the town of Pantai Remis, as daily commuting between the village and Pantai is not feasible and none of the families (except the headman) have cars. All the villagers depend on the headman for transporting the children to the primary school daily. Incidentally, his wife also teaches in the same primary school. Probably, the headman would function as an emergency service transport service if and when the need arises.

- Literacy level

Although situated quite far from schools, most of the villagers are able to read basic Bahasa Malaysia. The headman, however is very fluent in English. Most of the younger children stay behind in the villagers while the teenagers either live with a relative in town or boarding schools. Future plans include, among others, to do a survey of the level of education of the villagers in order to establish suitable environmental education programmes. As far as could be ascertained, all the younger children have been enrolled for primary education. In earlier discussions with the headman's wife, she expressed enthusiasm about the possibility of organizing a slide show and hands-on activities on environmental education for the children at Segari Primary School. Subsequent to these discussions, materials about available activities for schools were handed to her. Hopefully this will pave the way for the gradual introduction of suitable and relevant environmental awareness programme to which the villagers will be able to respond.

In considering literacy levels, the following communication methods were taken into account:

1. The language- Bahasa Malaysia
2. Level of language usage

3. Level of verbal literacy
4. Level of visual literacy
5. Preferences of the audience
6. Traditional medium of instruction
7. The need for an entertaining medium
8. Level of motivation to participate
10. Opportunity for feedback and participation

- Religion

Most of the villagers are Moslems (see role of religion during the workshop).

4.2 Making contact with the community

Due to an earlier survey of tropical stingless bees 1996-97m the Malaysian researcher had had previous contact with the community. This was definite advantage as issues such as the language, ethnic orientation and others about which members of the community may have felt apprehensive, could be addressed before the environmental education project was established. It also represented a form of continuity and progress.

In order to address the community's environmental understanding, their needs in relation to the environment, the problems existing in their local environment and the general environmental situation, as the locality had to be established. During the initial period individual households, as well as the headman, women, children and elders were approached to help in the assessment. Discussions with them, both formal and informal revealed the following:

NEEDS

1. BASIC AMENITIES LIKE PIPED WATER, SOLID WASTE DISPOSAL SYSTEM
2.SCHOOLS
3.MEDICAL FACILITIES

Environmental Problems

1. Previously litter was not a problem when people used forest products which are biodegradable on their own, but recently the introduction of materials that were not biodegradable such as plastics, have created litter and are deemed hazardous to marine life.
2. The sandy soil is not very suitable for the cultivation of food crops
3. Clearing of the natural vegetation for palm oil plantation is causing soil erosion and the loss of biodiversity as well increased runoff due to the lack of stabilizing effect of the natural vegetation.
4. Fishing as an economic activity is being seriously threatened by the monsoon rains and pollution.
5. Bush fires created by overzealous land clearing for agriculture are a hazard.
6. Urban migration is draining the village of valuable human resource

7. The natural habitat is being altered due to a combination of factors.

General remarks

1. Electricity was supplied to the village about 18 months ago. Before that, villagers used to interact closely, but now more and more time is spent watching television.
2. Needed urgently: schools and a health medical facilitator
3. Increased surface runoff to the sea and exposure of the soils to direct sunlight affect t the micro-climate and forest undergrowth
4. Bush fire is a serious hazard and its frequent occurrence is partly attributed to the clearing of land for palm oil plantations, as this creates a great deal of combustible materials which are easily ignited, especially during the dry seasons.
5. Young people prefer escaping the hardship of village life by migrating to towns and cities, further depleting the village of much needed human resource.
6 The power plant, plantations and haphazard development of chalets for tourists are placing and increasing pressure on the environment.

4.3 Initial discussion with the community

A number of families were approached, including the headman, provision shop owner and one of the more senior members of the community. Instead of immediately calling a village meeting, individuals and families were approached.

The researchers preferred organizing a gathering on a particular occasion and stating the researchers' role, the organization they worked for and the purpose of their visit. A slide or video presentation on the environment and community was subsequently presented and activities for children were conducted in an outdoor environment. This was done because there are no community halls and it was considered preferable to the headman' house as a neutral venue. A chart was then used and a discussion about environmental issues followed. The needs of the community, why and how the problems occur and the skills required to deal with the issues were addressed. Overall, from the feedback of the community attached little importance to their role as "stakeholders" in their own environment. More time and discussion s will have to be devoted to this aspect in the future.

During this time the researchers also offered slide show and activities such as making a solar cooker and recycling paper at the primary school. It was arranged that the headman' wife would extend these activities at subsequent meetings, which met with a general approval from cross sections of the women and children in the community. Some concepts about the environment were then introduced.

The headman was futhermore, encouraged to assist in doing an audit of the basic needs and problems faced by the community. A follow-up meeting was planned at the village.

5. CONDUCTING A FORMAL WORKSHOP WITH THE COMMUNITY

A workshop was planned between the project facilitator and the Malaysian

researcher (the facilitator of this sub-project). This workshop was designed on the basis of previous workshops offered by the project facilitator. Themes and topics for the workshop were planned according to his experiences. The Malaysian researcher assessed and approved the programme. A two-day workshop was envisaged and agreed upon. The purpose of the workshop was communicated to the headman and approved by him.

It was interesting to note that the workshop was conducted in an entirely basic and informal outdoor situation under some coconut trees facing the sea front.

A participatory / interactive approach was employed and the importance of lateral discussions with nearly all individuals who represented the village community was realized. The village is small and most community members attended the workshop. The discussions during the workshop was meant to be an initial dialogue with the people of the village and to be continued in subsequent community development workshops. During the workshop the members of the community were asked to relate what they saw as the components of the environment. They identified the following components.

The forests/ the sea/ rocks/ animals/ the river/ pollution / air / wells and water/ wild animals / snakes / haze / shelter (houses) / the peaceful atmosphere / flowers / smoke / the beach / sewerage / transport / fire / rain / fish / rubbish / construction / telephone s/ shops / road s/ chalets.

These environmental aspects were discussed and the occurrence of environmental problems in the local area were identified and enlarged upon. This could lead to support in solving the problems in future.

Although the workshop was interrupted due to community members having to leave for their evening prayers (Maghrib), the contact was useful and paved the way for further discussion during the evening meal directly after the workshop. The workshop was concluded by one of the facilitators who summarized the aims and objectives of the session and thanked the villagers for their participation in the project. The children were subsequently invited to participate in environmental education activities the next day. They were introduced to activities such as paper-brick making, artwork and papermaking. A demonstration was also given on the functioning of a sun stove.

A wall of a house was also decorated with posters on the environment. This attracted some interest and discussions amongst the villagers.

6. CONCLUSIONS MADE ON THE BASIS OF THE WORKSHOP, EXPRIENCES AND DISCUSSIONS

A support group needs to be established from the surrounding area and a village committee should be established to assist the headman in carrying out an environmental audit and other activities.

6.1 The strategy for forming an audit committee as discussed with the headman is as follows:

- Planning an audit
- Explaining and introducing the process (What, Why, How?)
- Conducting the situation analysis
- Identifying the ideal situation
  (concerning the economic, social and environmental context)
- Ways to achieve the ideal situation
- Implementing the audit
- Evaluation / discussions
- Follow-up and continuity of the positive results from the audit

6.2 The selection of a suitable time is crucial to the participation of the villagers. In this case, the researchers neglected to take religious realities into account (the evening prayers). However, a positive consequence of this interruption was the interval allowed informal discussion to commence, with the added benefit of capturing the holding the villagers' attention.

6.3 It is useful to involve children in the workshop, because a number of women (mother)showed keen interest in the children' activities.

1. SOME BARRIERS ENCOUNTERED IN IDENTIFYING A SUITABLE COMMUNITY FOR THE WORKSHOP

There was little opportunity to approach the headman or leader of the communities, except towards the late evening, as they were preoccupied with their daily tasks. Approaching the women in an effort to establish communication and enlisting their help in convincing their husbands to co-operate produced better results. Getting the whole village to congregate proved to be a big challenge as they had no residents committee. One way in which this problem was addressed was to organize a lunch of dinner gathering to invite participation in an informal way or to meet most of the community members directly after Friday prayers at the mosque if they are predominantly Moslems.

In addition, it was difficult to explain some concepts, for example " conservation" and " sustainable". This was more successfully done with the help of a three dimensional 1.3 m x 1.3 m model of an island (made using discarded Styrofoam and painted to resemble an island). Children were attracted to this model and in this instance the immediate environment could be linked to the model. The model was used to explain the concepts of conservation and sustainability. Transparencies on environmental education, slides on coastal habitats in Malaysia, a video on protected areas and books on environmental education in Bahasa Malaysia prepared by the Education Department of the Malaysian Nature Society, were also used to explain basic environmental concepts more clearly.

CONCLUSION

Environmental education and communication can be used as a tool to make people more aware of the effects of their actions on their immediate environment. Through environmental education and communication information can be provided to communities to help solve or address some of the environmental problems and develop or stimulate skills to encourage them to take action and become more involved in the prevention of environmental problems.

Having completed this initial survey, discussions and workshop, the villagers were generally found to be receptive, but more time needs to be spent with them to encourage and cultivate their involvement in environmental conservation as a community. The communication strategies found most successful were interpersonal communication methods such as round table meetings, through mosque and village elders as well as hands on participatory and demonstrative activities.

Finally, it was found that the villagers recognized the importance of using education as a tool to improve their quality of life, but a pressing need to improve their economic status is perceived as a major factor that influences their views on conserving the environment.

ACKNOWLEDGEMENTS

This workshop was made possible with the co-operation of the headman, who is popularly known as Abang Kamal and his wife Kak Indon. In addition, the generosity of Frank Weiss and Annetta Zimmerman, two German researchers who have a long standing association with the Nature Education Centre (NEC) of the Malaysian Nature Society, and who are studying small mammals in the village, have made the initial contact possible. The researchers were also offered free accommodation at their house and were able to use it as a base throughout the duration of the workshop. This could be extended to future programmes.

Development Objective
(Long-Term Objective)
of
The Project Vie/98/018
"Environmental Education in the Schools of Vietnam"
(1999-2004)

The overall object of this Project is to promote greater environmental protection in Viet Nam through influencing the values, attitudes and behaviors of school children toward the environmental. This will be accomplished by enhancing the ability of the Government of Viet Nam to deliver learner-centered, problem-solving, cross-curricular education for the environmental to primary and secondary school children.

This "education for sustainability" already incorporated into a National Policy Statement and Implementation Strategy for Environmental Education and elaborated in teacher training guidelines and materials of the Project will be consolidated and strengthened through awareness raising, consensus-building and capacity building in the environment and education systems at all levels in Viet Nam, to ensure that they have the ability to deliver environmental education as integral to all their activities, thus ensuring that it can ultimately be sustained within these sysytems.

The overall objective of the project is to promote greater environmental protection in Viet Nam through influencing the values attitudes and behaviors of school children toward the environment through a comprehensive program of environmental education.

Immediate Objectives

MOET : MINISTRY OF EDUCATION AND TRAINING EE : ENVIRONMENTAL EDUCATION

SG : School-Greening

	Phase 1	Phase2	Main Outputs	Target groups
OBJECTIVE 1	To support the development of a National Policy and Implementing Strategy for Environmental Education in Vietnam	To assist the education system in Vietnam to put into effect the National Policy on EE and Implementation Strategy for EE	• National Policy on EE for the Schools of Vietnam • National Implementation Strategy for EE for the schools of Vietnam • National and Provincial EE Action Plans • National Course in EE •National and Regional EE Resource Centers	Decision-makers from : • Ministry level •Provincial Department level •School level National EE Advisor s Provincial EE Supervisors
OBJECTIVE 2	To enhance the capacity of MOET to deliver EE content and methodologies in teacher-training programs	To promote the full implementation of the EE Guidelines for Teacher Trainers in the pre-service training of teachers	• EE Network in Vietnam • EE Guidelines for Teacher Trainers • Use of the EE Guidelines in teacher training Universities and Colleges • Use of the EE Guidelines in the annual in-service training programs for teachers	Teacher Trainers from Teacher Training Universities and College National EE Advisors Provincial EE Supervisors Teachers

			• Supplementary eaching/learnin g materials based on EE Guidelines	
O B J E C T I V E 3	To develop specific EE activities for implementation at the primary and secondary schools levels	To expand and enhance EE practice in primary and secondary schools through the curriculum. extra-curricular Activities and chool/commun ity links	• School-greening pilot program • School-reening Guide for Teachers • Use of the SG Guide in the annual in-service training programs for teachers • EE Newsletters	Teacher and Students in the schools Local Community Provincial EE Supervisors

SOME FIGURES OF PROJECT VIE/95/041

TOTAL BUDGET: 799 400 USD
DURATION: 2years (1996-1998)

- 37 tangible outputs
- 20 National and Regional Workshops
- Almost 1000 people who were trained through Workshops and Seminars
- 23 people who were participated overseas training prog
- 1 Study tour
- 14 missions of International Experts (almost 1.5 working month per 1 mission)
- 19 missions of project staff to DOETs and Teacher Training Institutions
- 1 National Campaign on Environment Education
- 2 National Pilot Programs with 14 Teacher Training Institutions and 8 Schools
- 23 new broadcasting on mass media (1 report, 9 news on Central TV, 3 news on Hanoi TV, 5 news on radio station of Vietnam, 14 news on newspaper)
- 0,05% out of 25 000 schools benefited from School Greening Programme
- 62 Teacher Training Institutions benefited from the learner-centre methodology
- 60 000 EE Newsletters
- 30 000 General EE Guidelines foe Teacher Trainers to Teacher Training Institutions
- 5 000 School Greening Guides for Teachers
- 4 000 Implementation Policy and Strategy in the schools of Vietnam
- 3100 entries of students through National School Greening Campaign

List of Project Tangible Outputs
VIE/95/041
Environmental Education in the schools of Vitnam

BJECTIVE	No.	TITLE OF OUTPUT
BJECTIVE1	1	ational Policy for Environmental Education in the chool of Vietnam
	2	mplementation Strategy of Environment Education n the schools of Vietnam
	3	eport of the Fellowship on Environmental ducation Policy and Strategy (UK Nov-Dec 1996)
	4	inal report on the survey results of the Real ituation of Environmental Education in General chools
	5	eport on the National Workshop on Environmental ducation Policy and Strategy
BJECTIVE2	6	eneral Environmental Education Guidelines for eacher Trainers at Primary level
	7	eneral Environmental Education Guidelines for eacher Trainers at Lower Secondary level
	8	eneral Environmental Education Guidelines for eacher Trainers at Upper Secondary level
	9	nvironmental Education Modules for Primary chools
	10	nvironmental Education Modules for Lower econdary Schools
	11	nvironmental Education Modules for Upper econdary Schools
	12	eport of the Fellowship on Environmental ducation Teaching Methodologies (USA Nov-Dec 1996)
	13	eport of the Fellowship on Environmental ducation Teaching Training (Malaysia Nov-Dec 996)
	14	eport on the National Workshop on Environmental ducation Guidelines for Teacher Trainers(Sept-Oct 997)
	15	eport on the National Workshop on Developing xample Environmental Education Activity for eachers(Jan 1997)

	16	eport on studying Integration and Developing nvironmental Education in the Teacher Training chool System
	17	eport on the National Capacity Building Workshop Mar 1998)
	18	ollection of Questionnaire for Gathering Opinion
	19	nvironmental Education Newsletter No.1 (Sept 997)
	20	nvironmental Education Newsletter No.2 (Jan 998)
	21	nvironmental Education Newsletter No.3 (June 998)
	22	nvironmental Education Newsletter No.4 (Sept 998)
OBJECTIVE3	23	chool-Greening Guide for Teachers
	24	eport on the Studytour in Singapore and Malaysia June 1996)
	25	eport on the National Training Workshop School-reening Guidelines(Nov 1997)
	26	eport on the Writing Workshop and National ymposium on School-Greening (June 1998)
	27	eport on School-Greening Evaluation(Oct-Nov 998)
		roducts of "Together for Green" Competition:
	28	riting(1168 products)
	29	Recycle (174 products)
	30	Drawing(1745 products)
	31	Propaganda programme on video tape(13 tapes)

ENERAL REPORT	32	Project Inception Report(Nov 1996)
	33	Project Performance Evaluation Report(June 1997)
	34	Project Monitoring Report (Sept 1997)
	35	Project Monitoring Report (Apr 1998)
	36	Mission Report of (Nov 1996)
	37	Final Project Report(Dec 1998)

우리강산 푸르게 푸르게 - 흔히 볼 수 있지만 고마운 우리나무들

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